Healing within STEP

Author: Tony Ranger

Technical Director

Theorem Solutions ***Limited***

Presenter: Tom Kloecker

tony@theorem.co.uk tom@theorem-usa.com

Healing within STEP

Theorem Solutions

STEP may be used to define data for the whole product for the complete life cycle

Here we are talking within the context of

- model geometry
- data exchange

Healing within STEP

Theorem Solutions

Why do we need healing for STEP

Healing is often taken as the means of fixing bad data

Healing here is also defined to be the means of manipulating data to make it fit for a purpose other than that for which it was created

Healing within STEP

Theorem Solutions

…. a means of manipulating data to make it fit for a purpose other than that for which it was created -

- transfer between systems
  - different tolerances
  - different validity rules
- transfer between disciplines
  - for example - removal of fillets / blends

Healing within STEP

Theorem Solutions

Healing can also be applied to the need to manipulate data which is not as intended

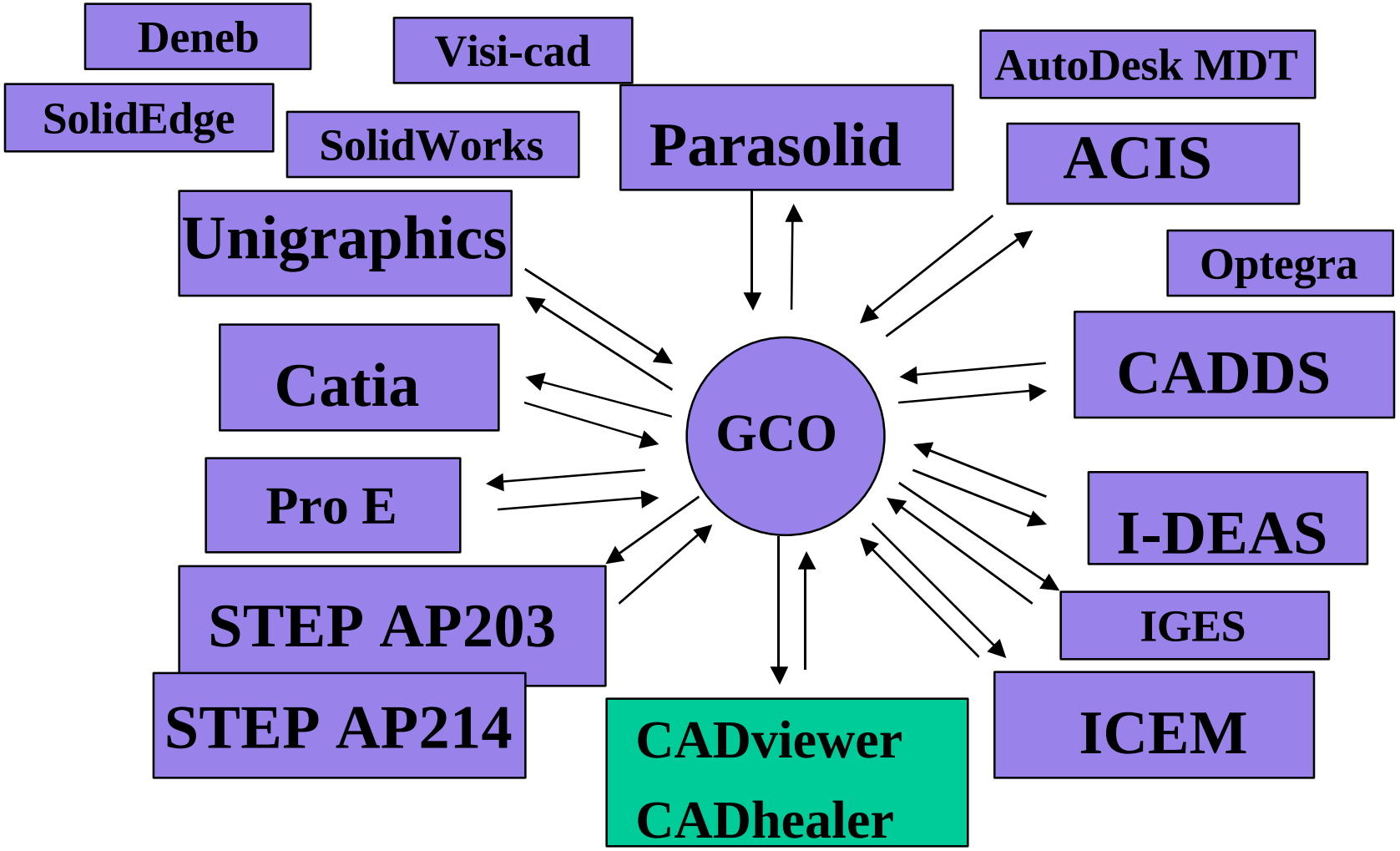
Not what the user expected or wanted

Not what the originating system intended

Healing within STEP

Theorem Solutions

Theorem Product Architecture



Healing within STEP

Theorem Solutions

CADhealer provides processing of

System A to STEP

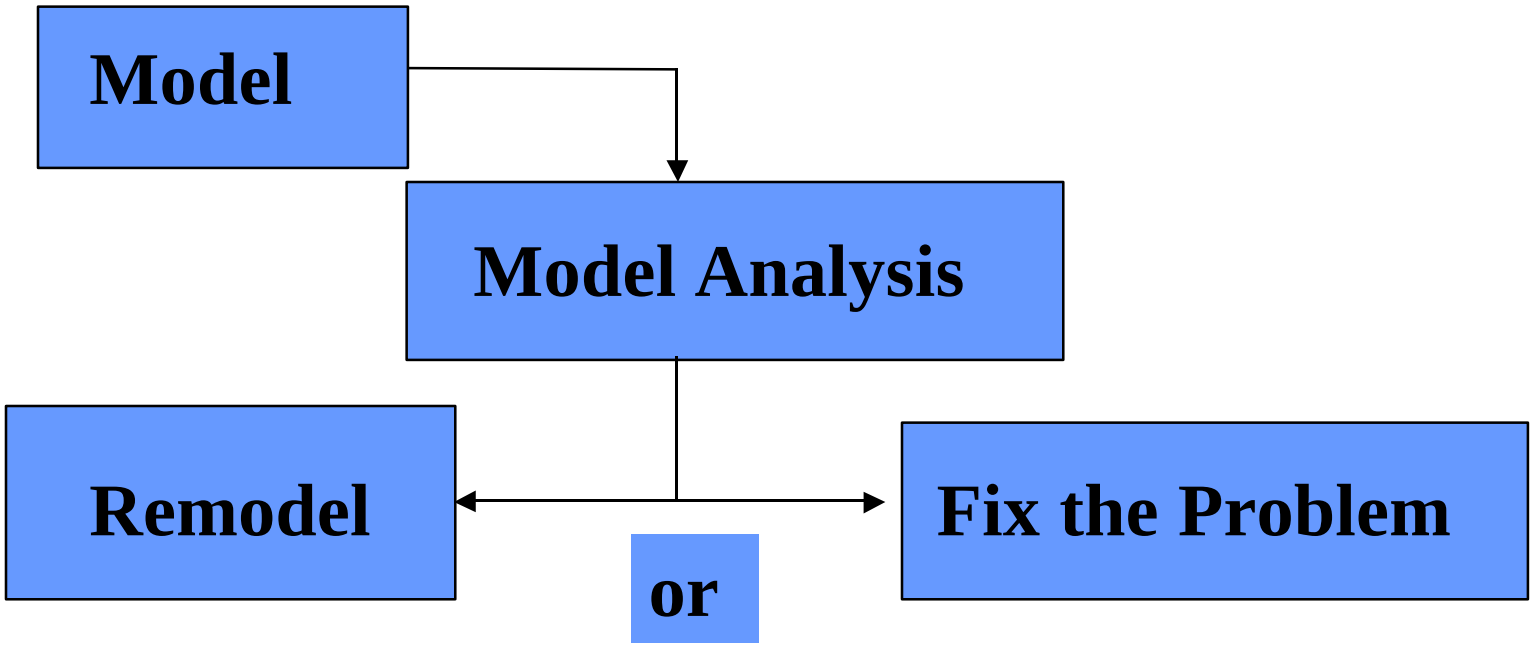
STEP to system B

STEP to STEP

Healing within STEP

Theorem Solutions

CADhealer - Analyse and Fix Options



Healing within STEP

Theorem Solutions

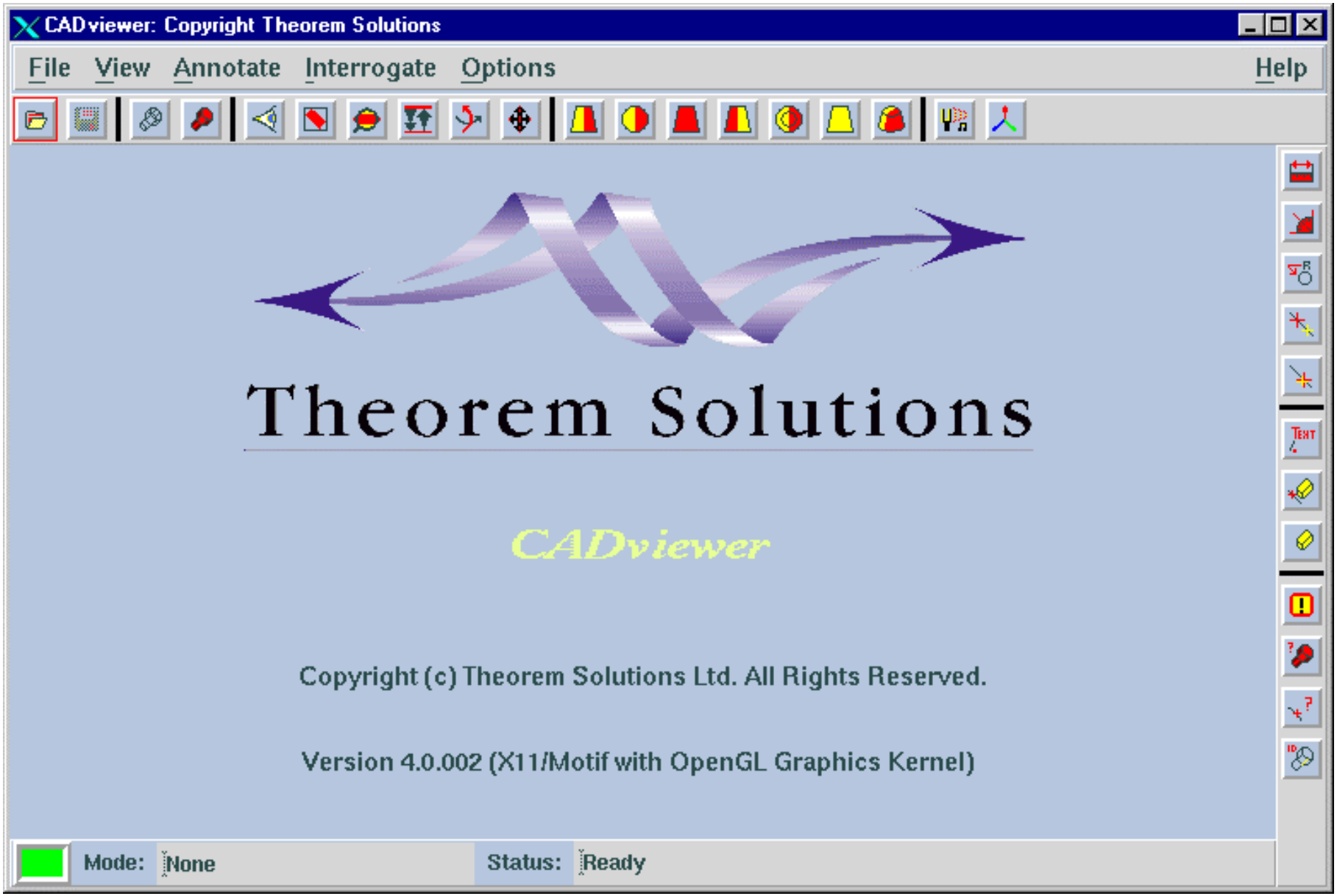
CADhealer - Analyse and Fix Options

Allows user to examine and process ...

- Small features
- Accuracy issues
- Topology issues
- Orientation errors
- Shell issues
- Surface sewing problems
- Blend removal or replacement

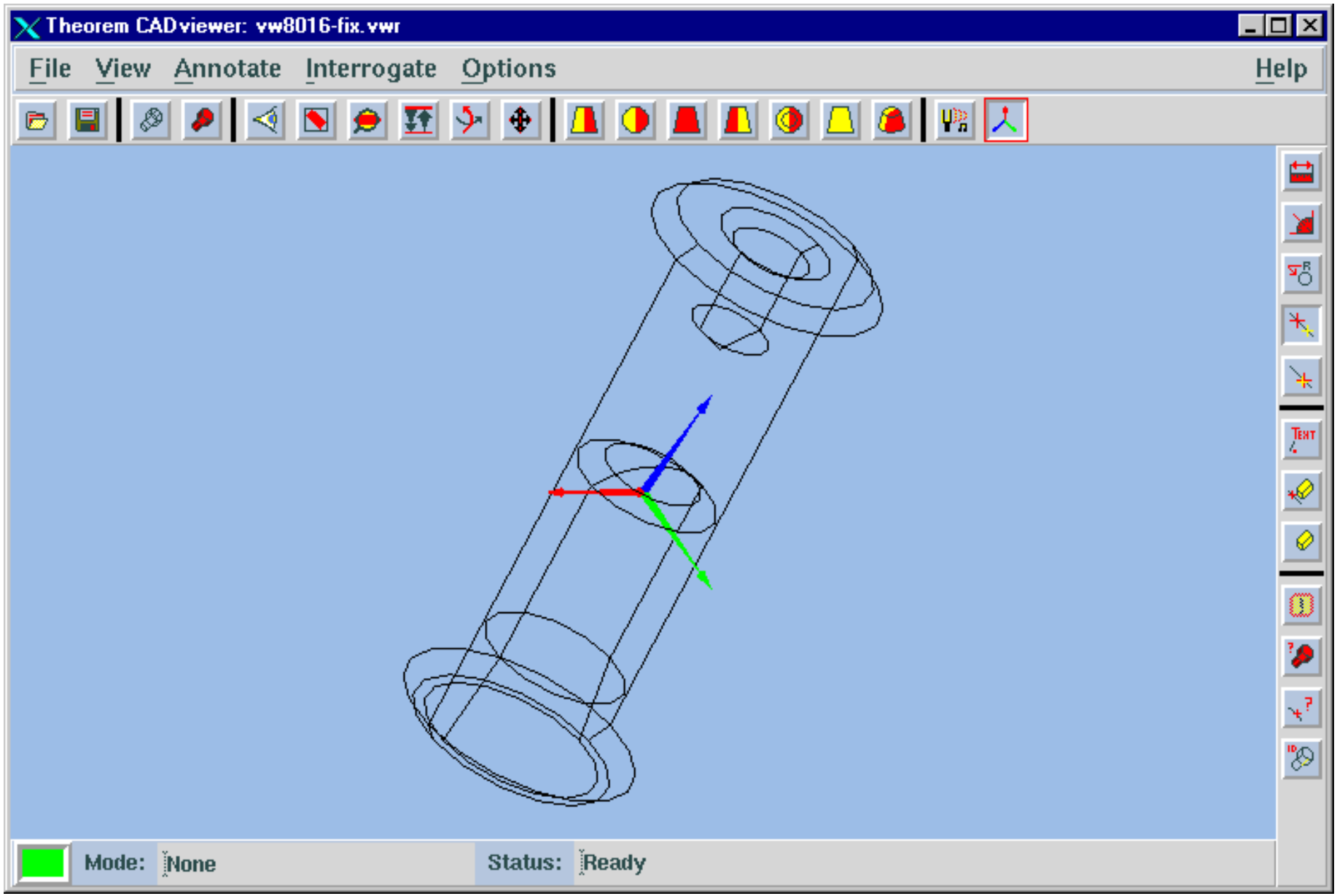
Healing within STEP

Theorem Solutions



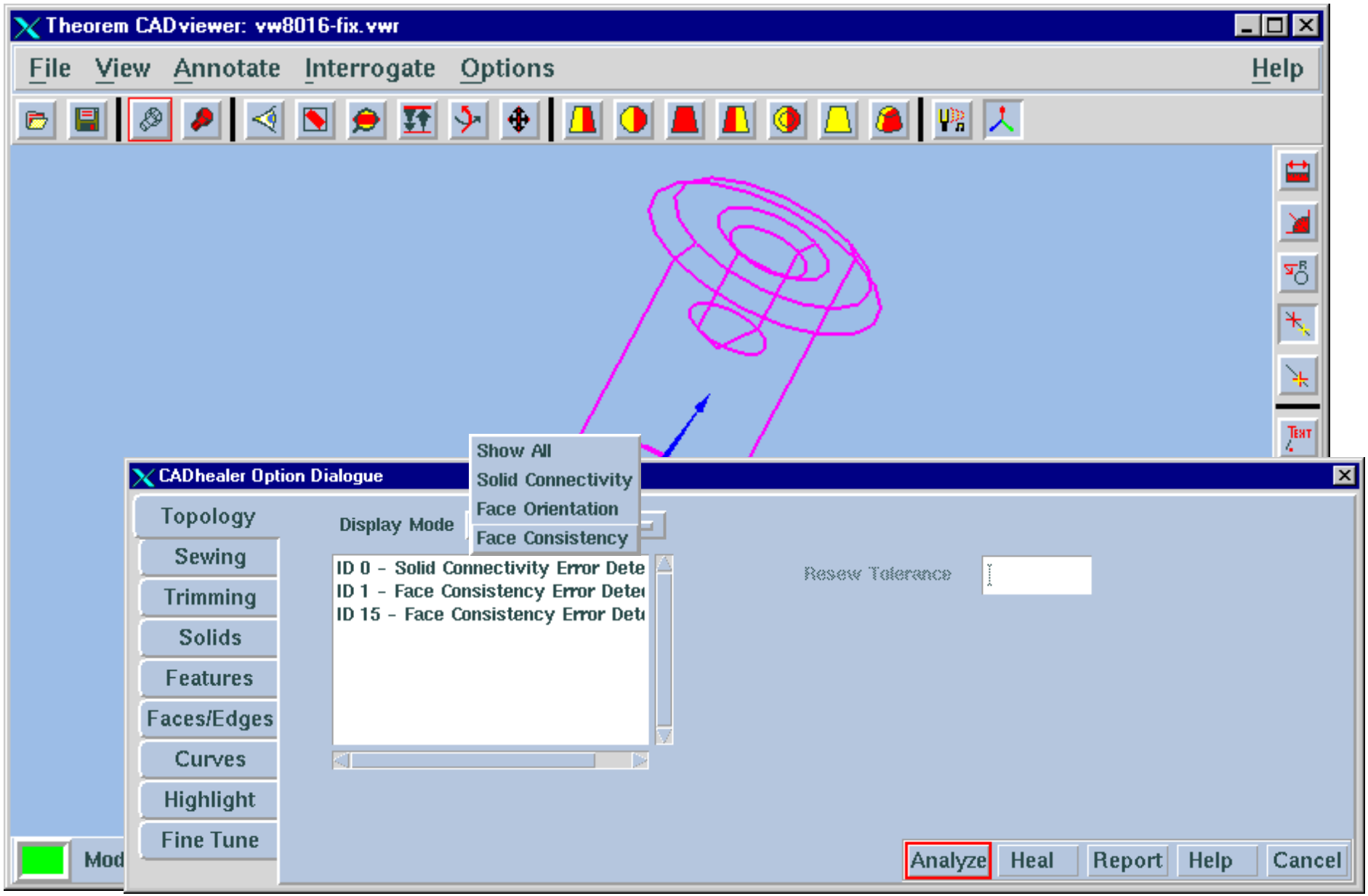
Healing within STEP

Theorem Solutions



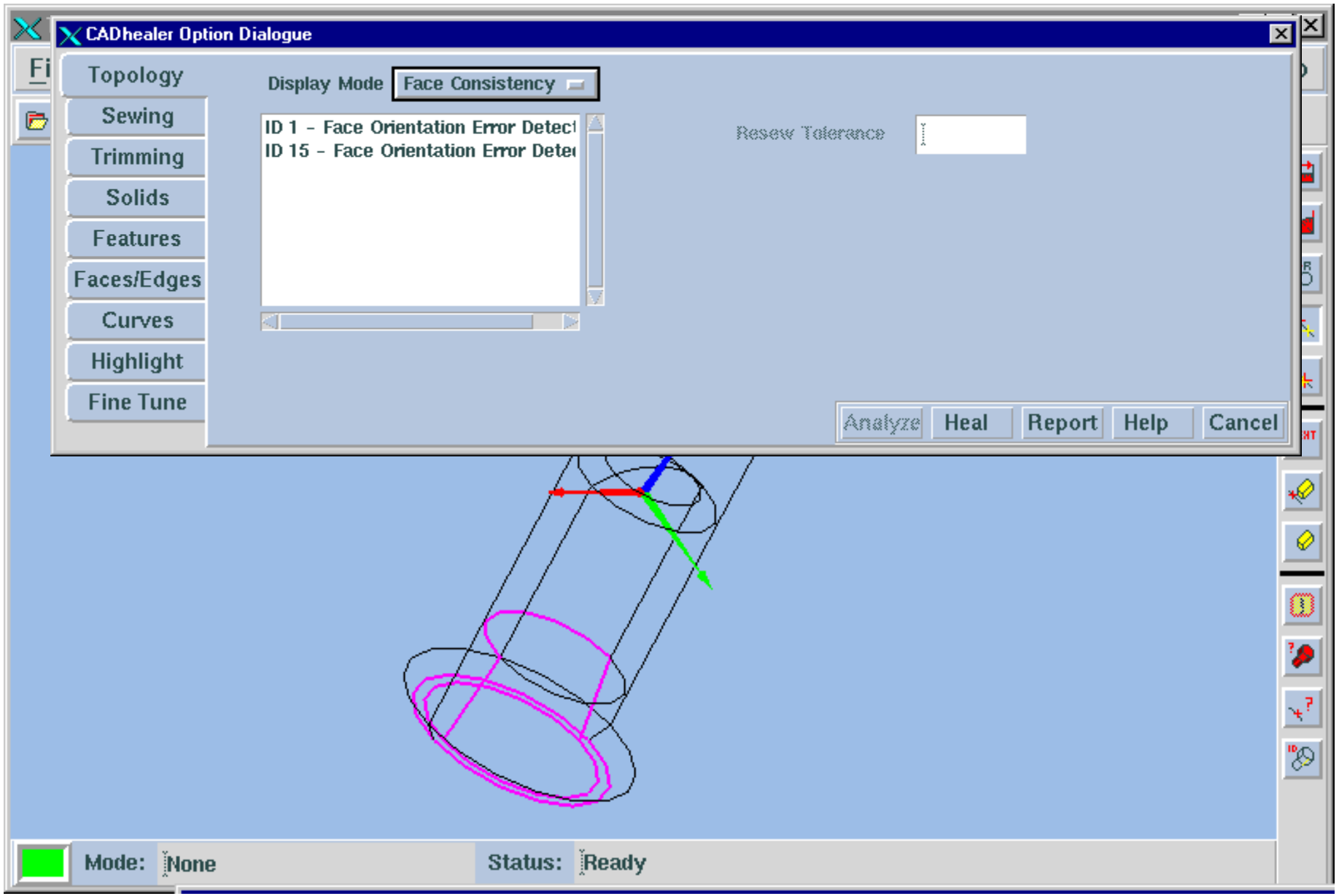
Healing within STEP

Theorem Solutions



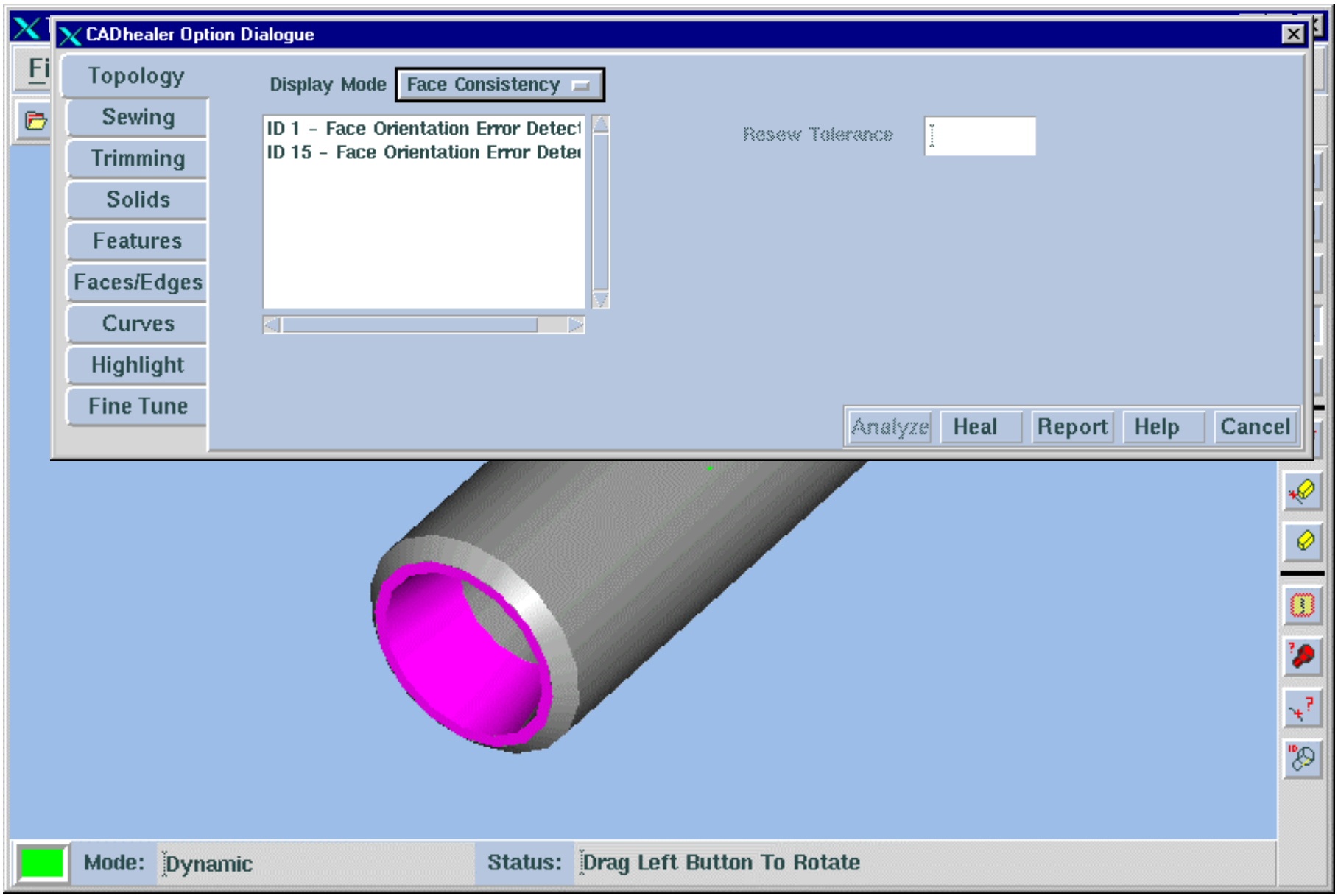
Healing within STEP

Theorem Solutions



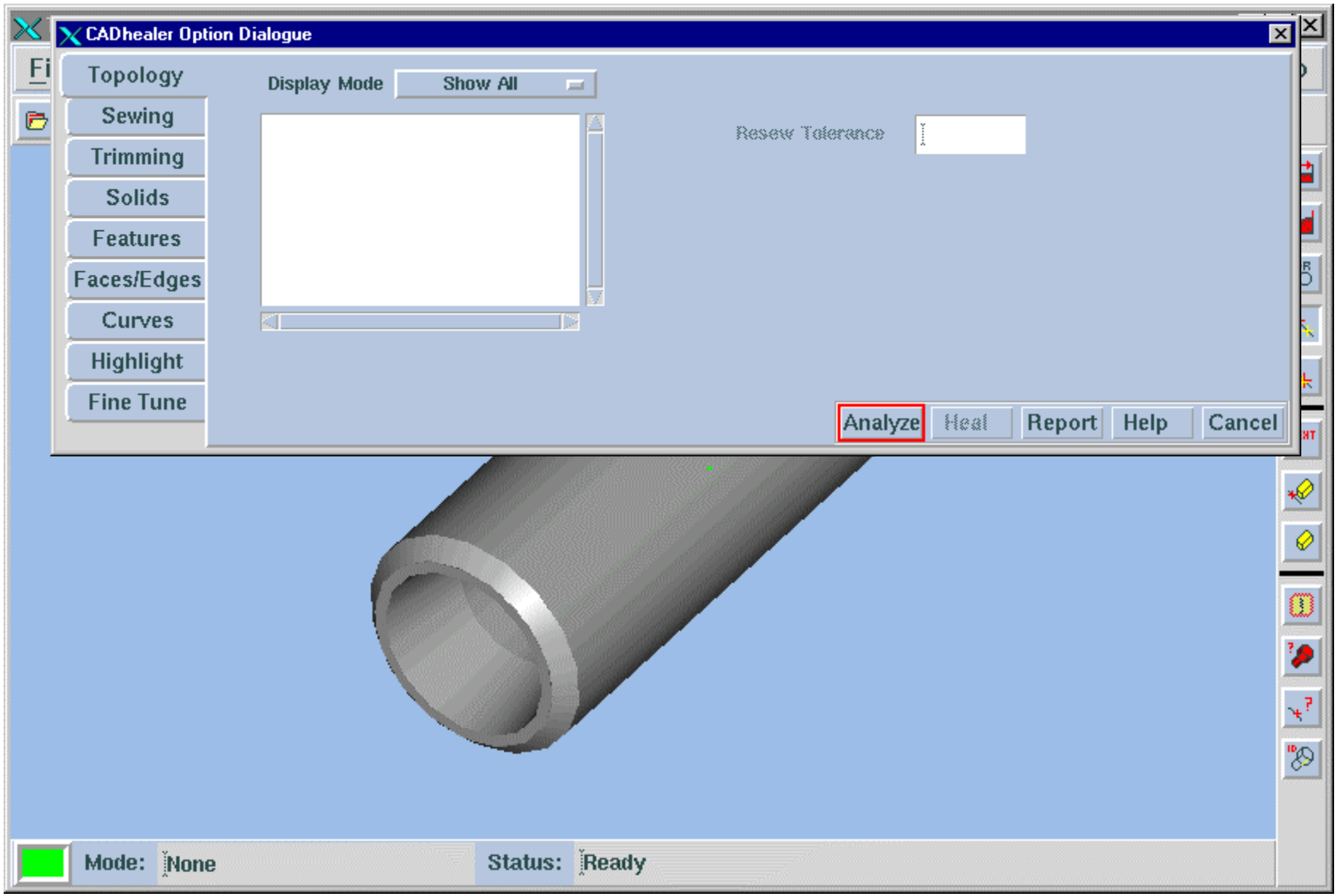
Healing within STEP

Theorem Solutions



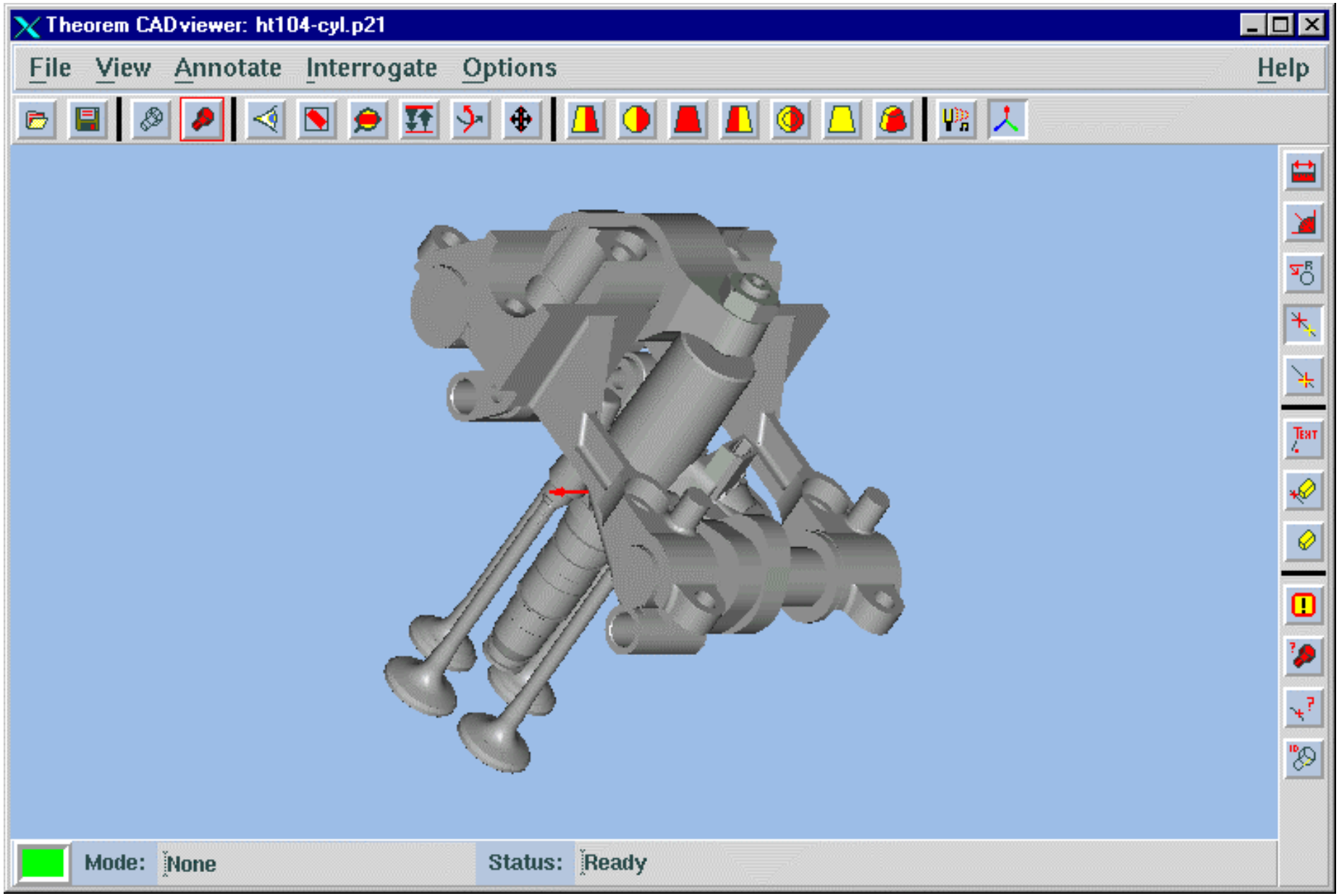
Healing within STEP

Theorem Solutions



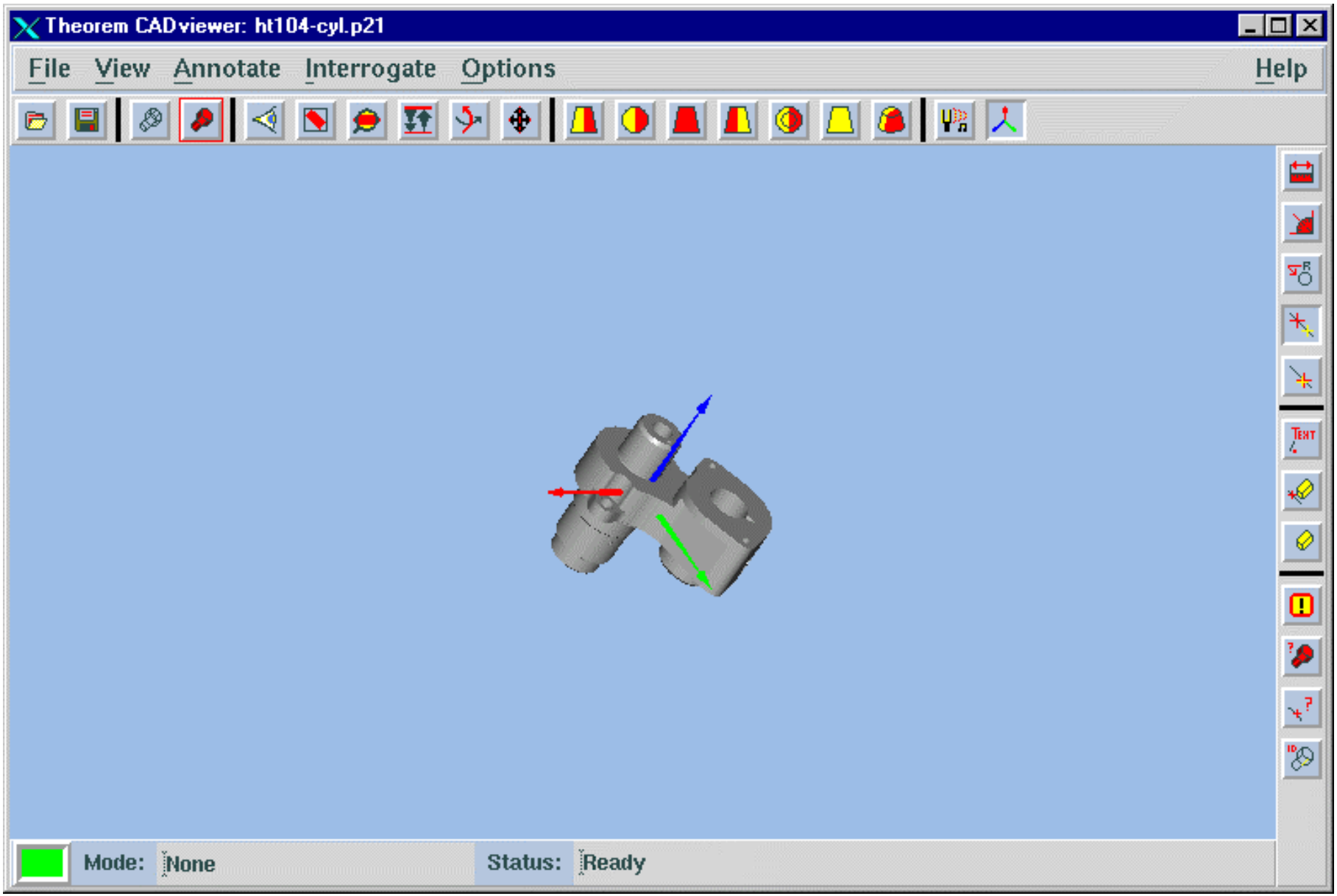
Healing within STEP

Theorem Solutions



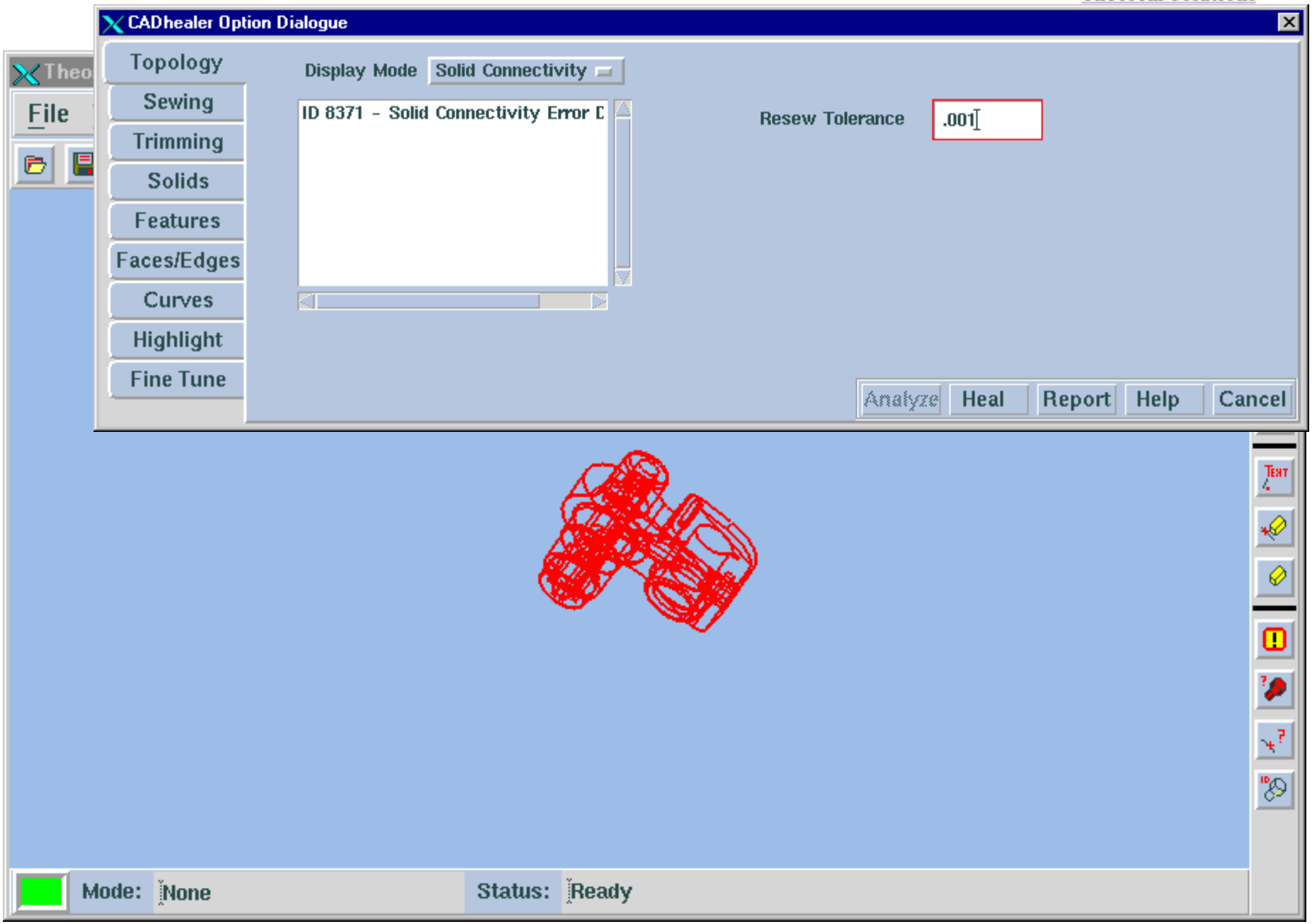
Healing within STEP

Theorem Solutions



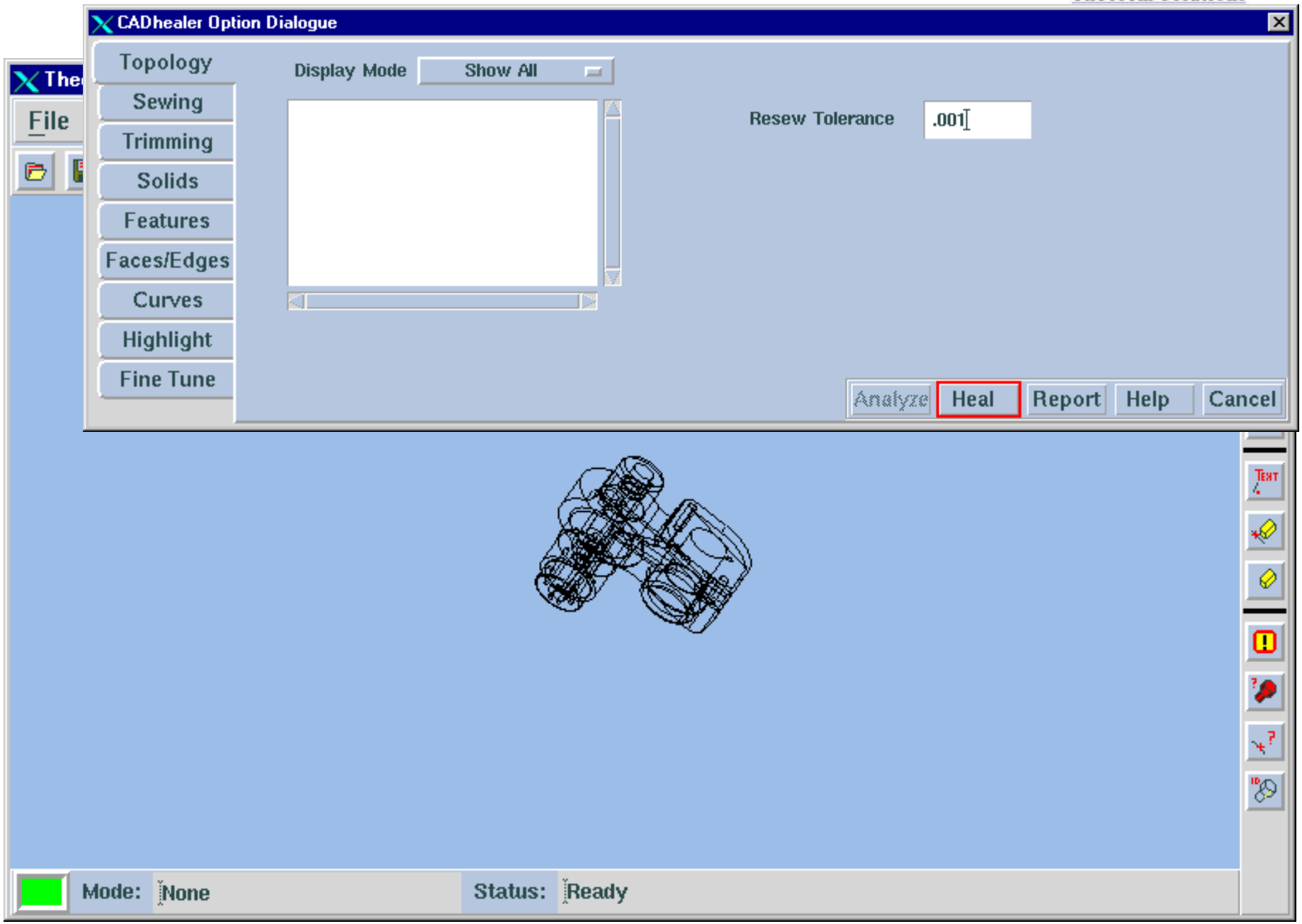
Healing within STEP

Theorem Solutions



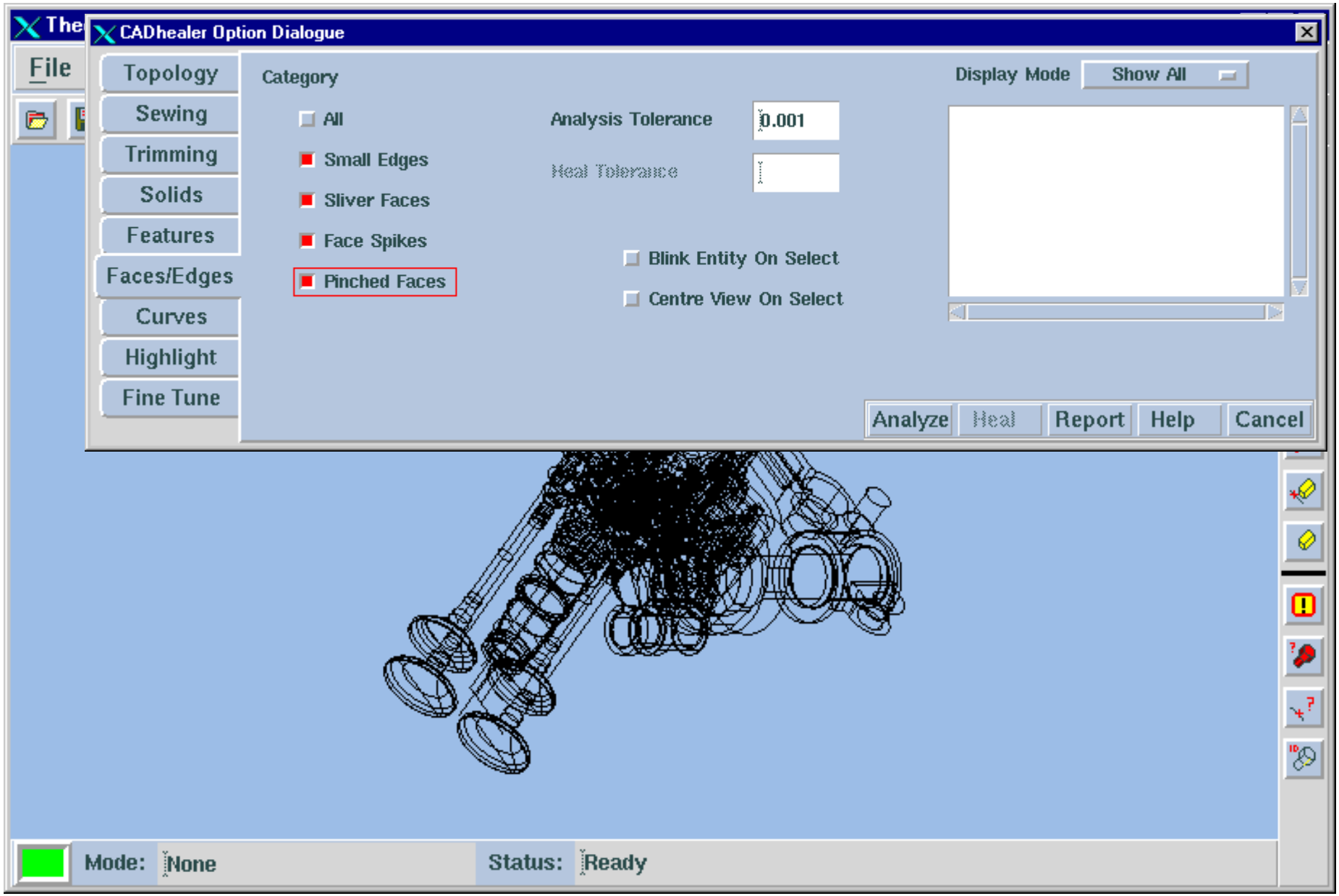
Healing within STEP

Theorem Solutions



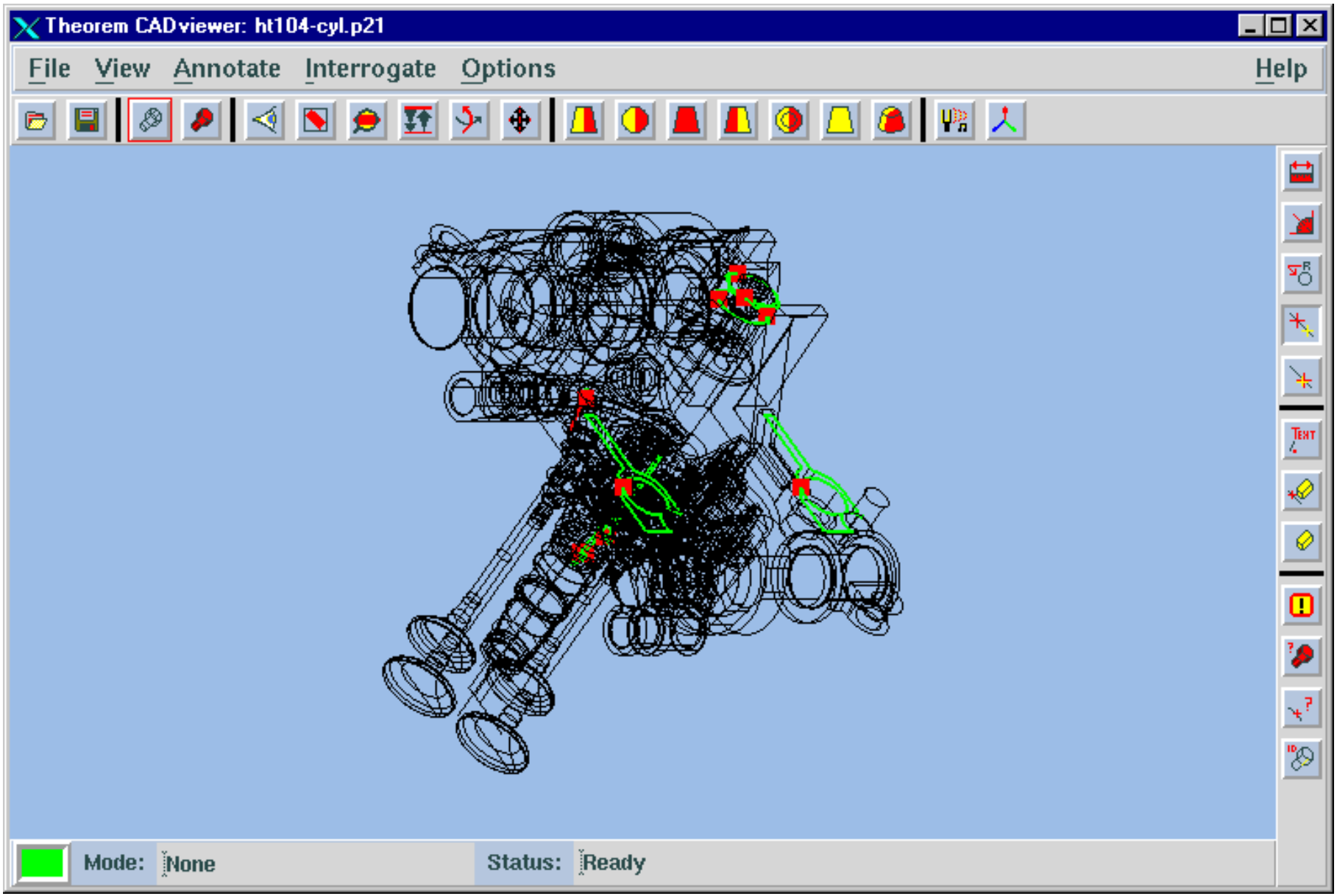
Healing within STEP

Theorem Solutions



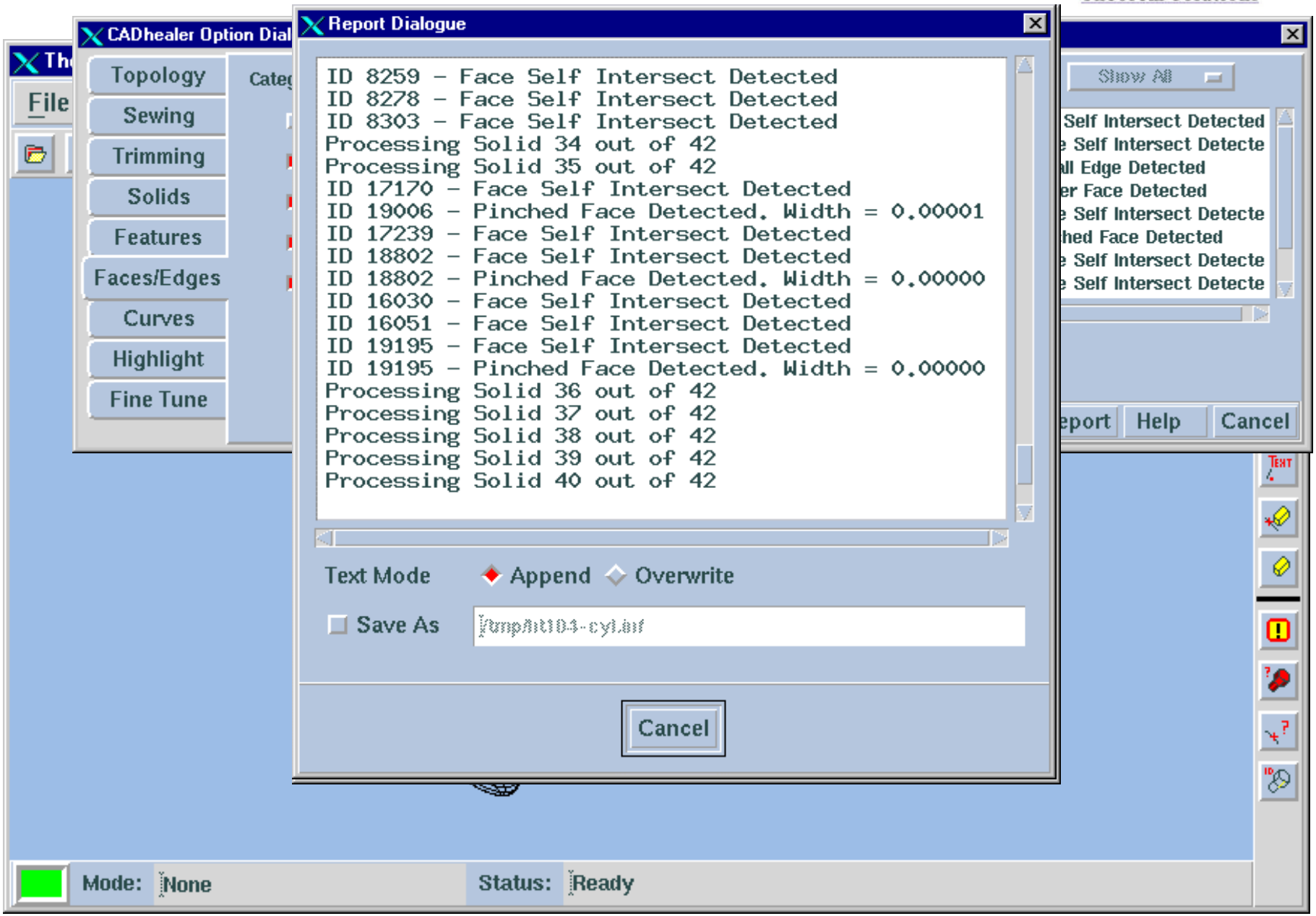
Healing within STEP

Theorem Solutions



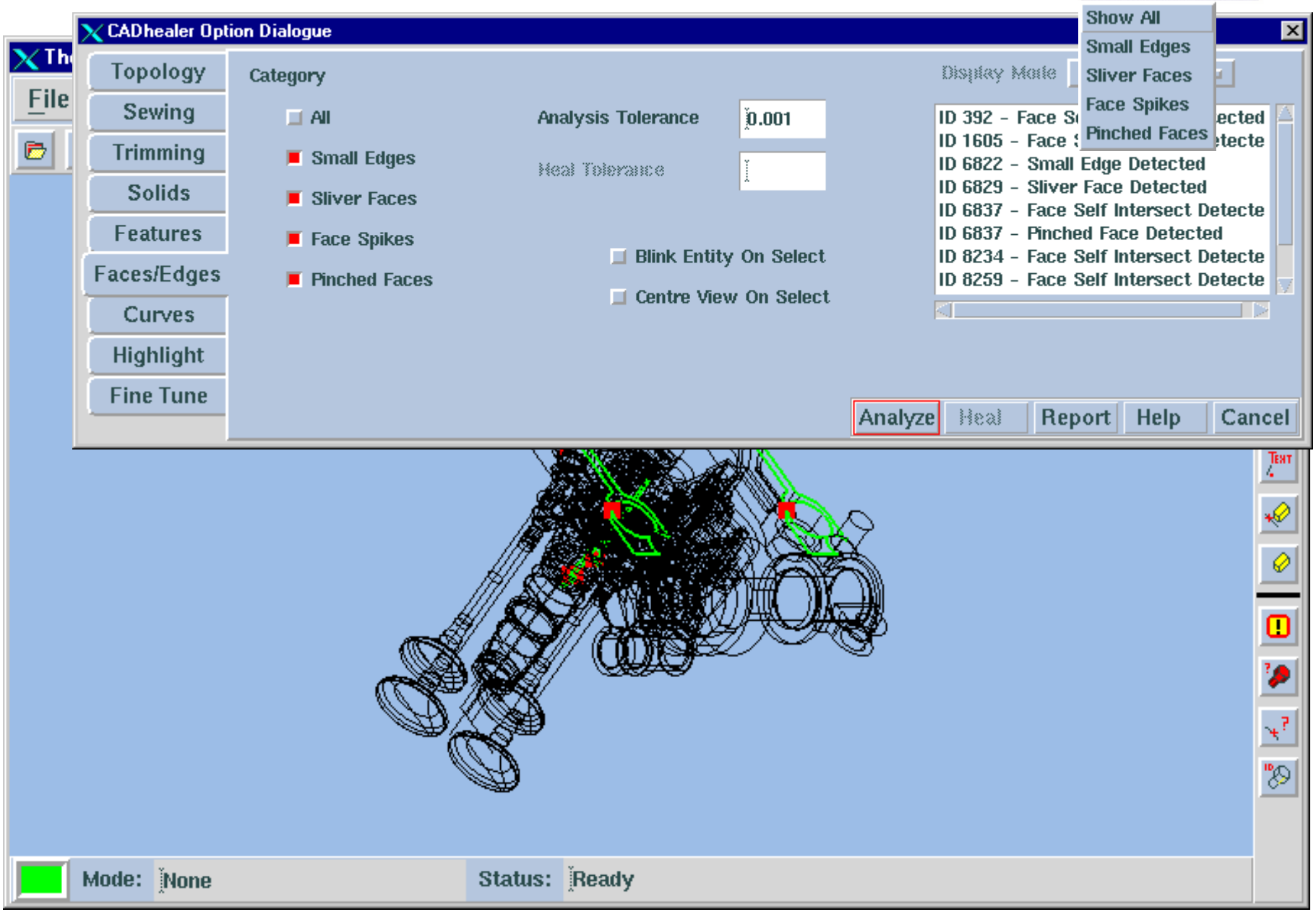
Healing within STEP

Theorem Solutions



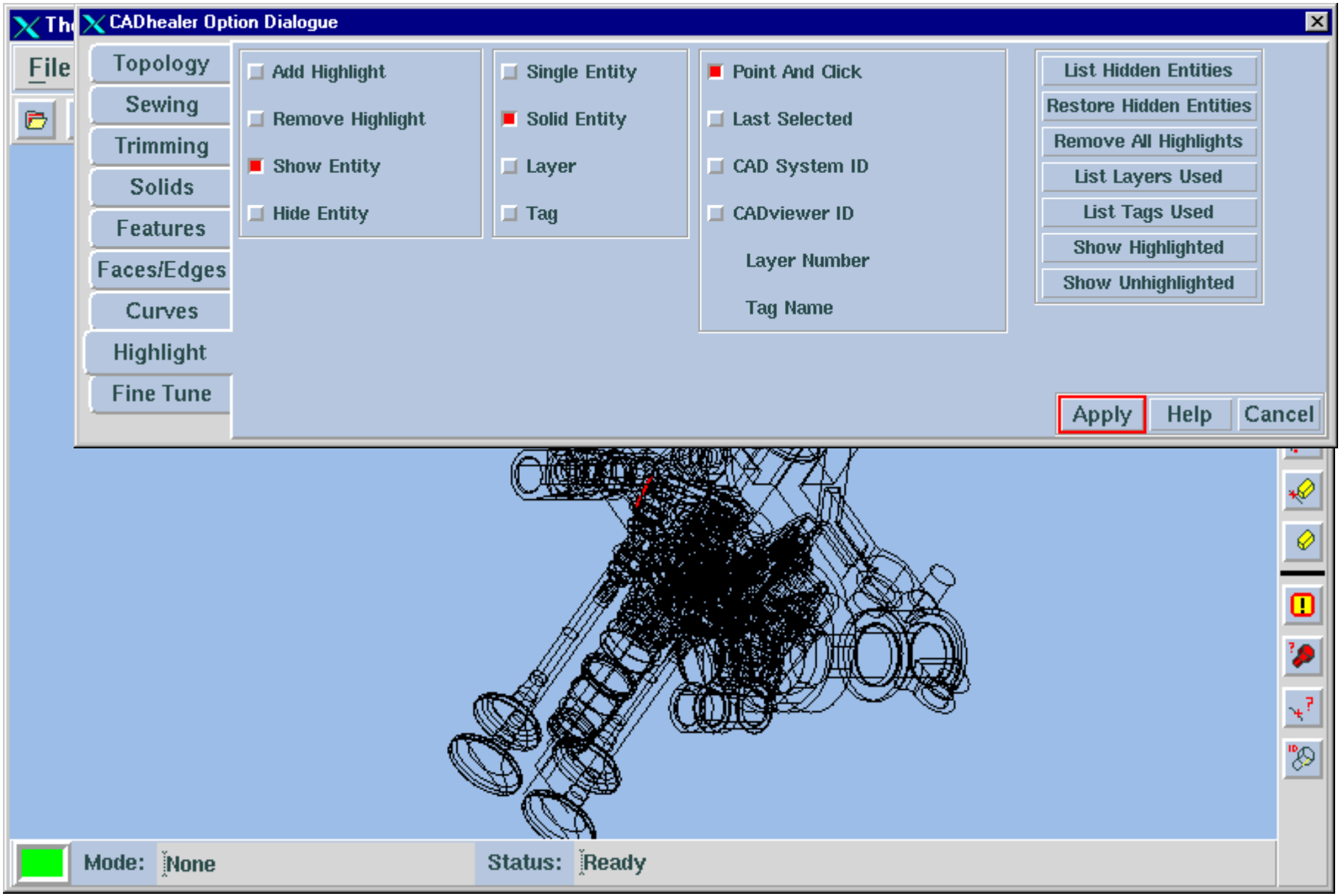
Healing within STEP

Theorem Solutions



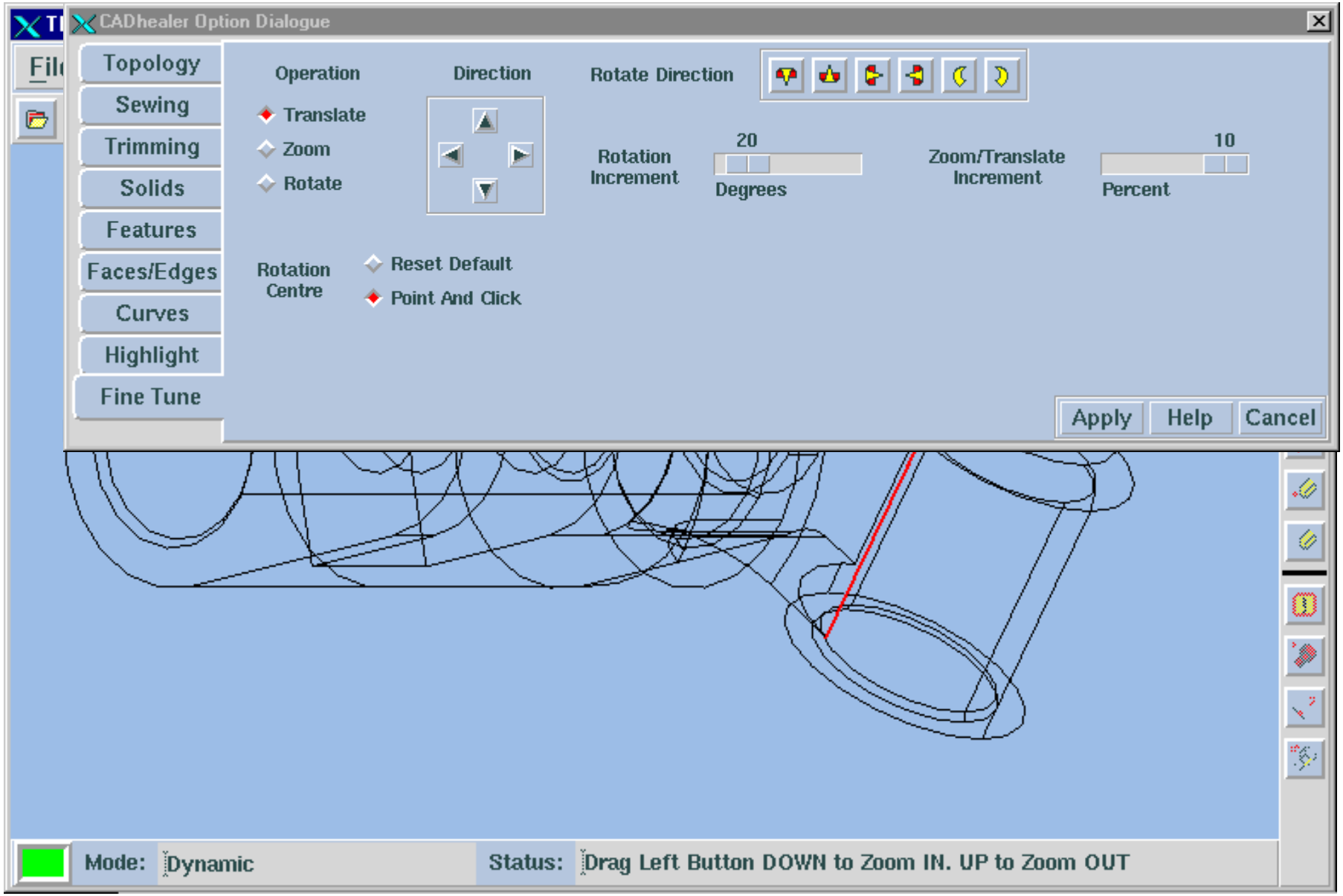
Healing within STEP

Theorem Solutions



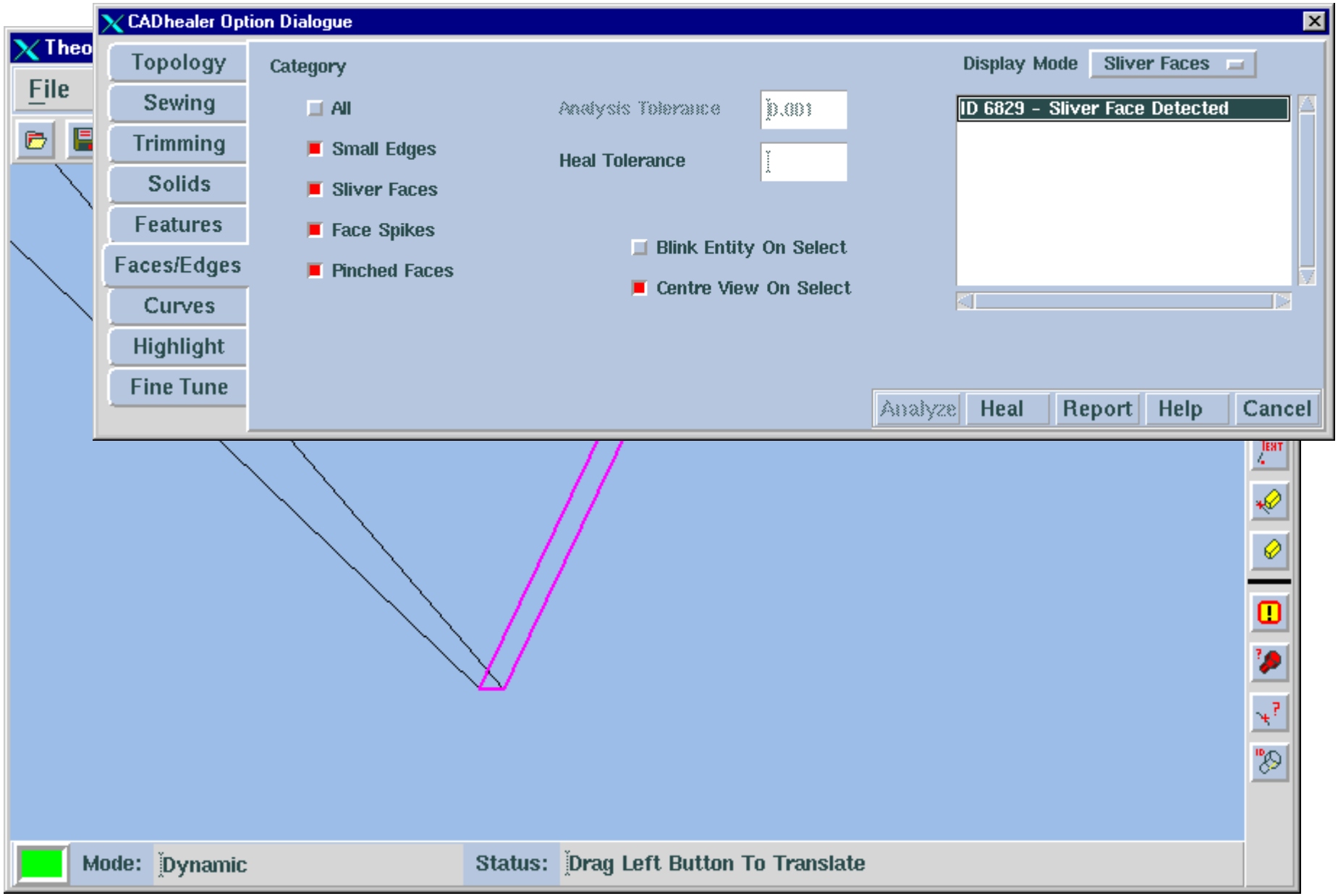
Healing within STEP

Theorem Solutions



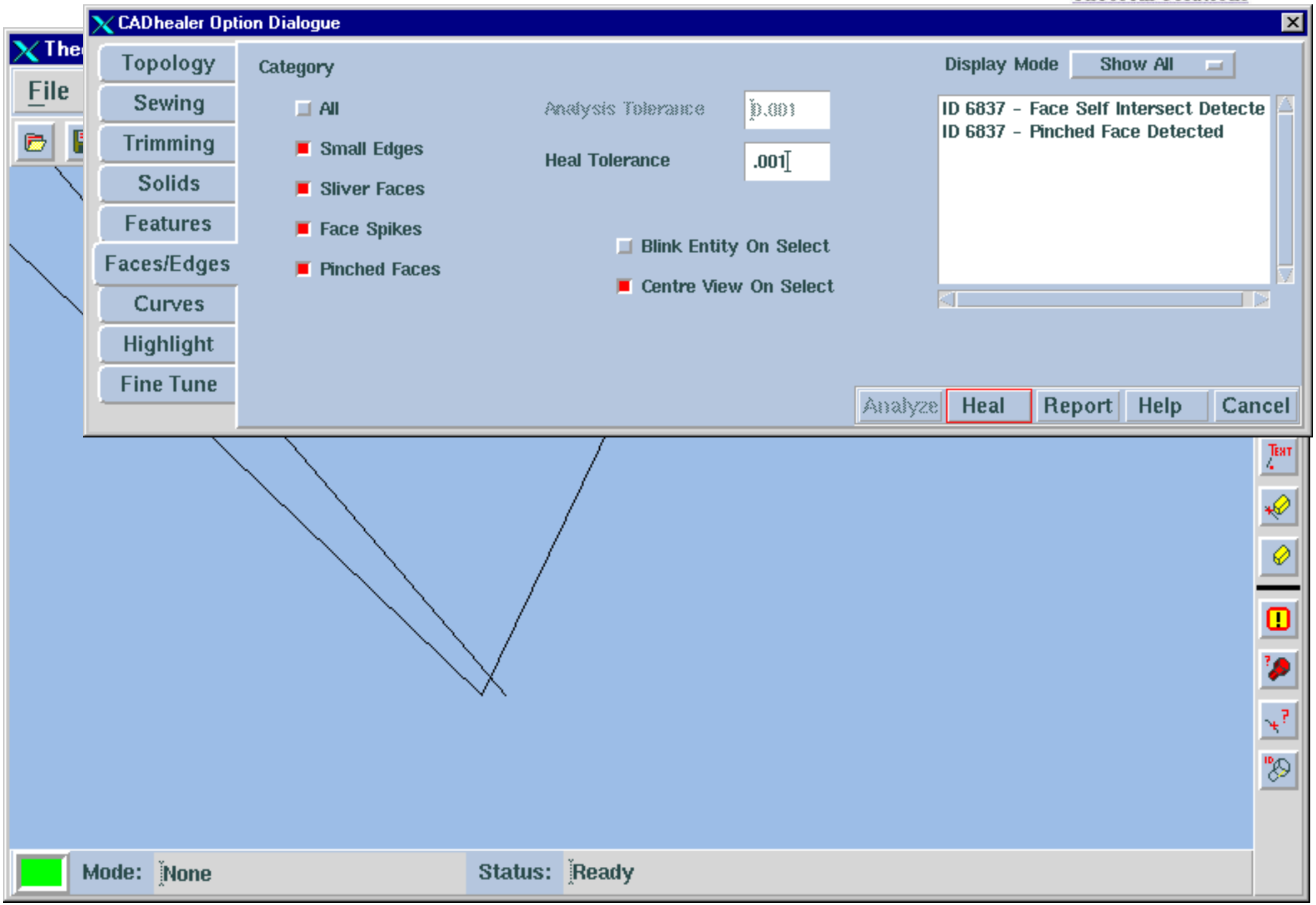
Healing within STEP

Theorem Solutions



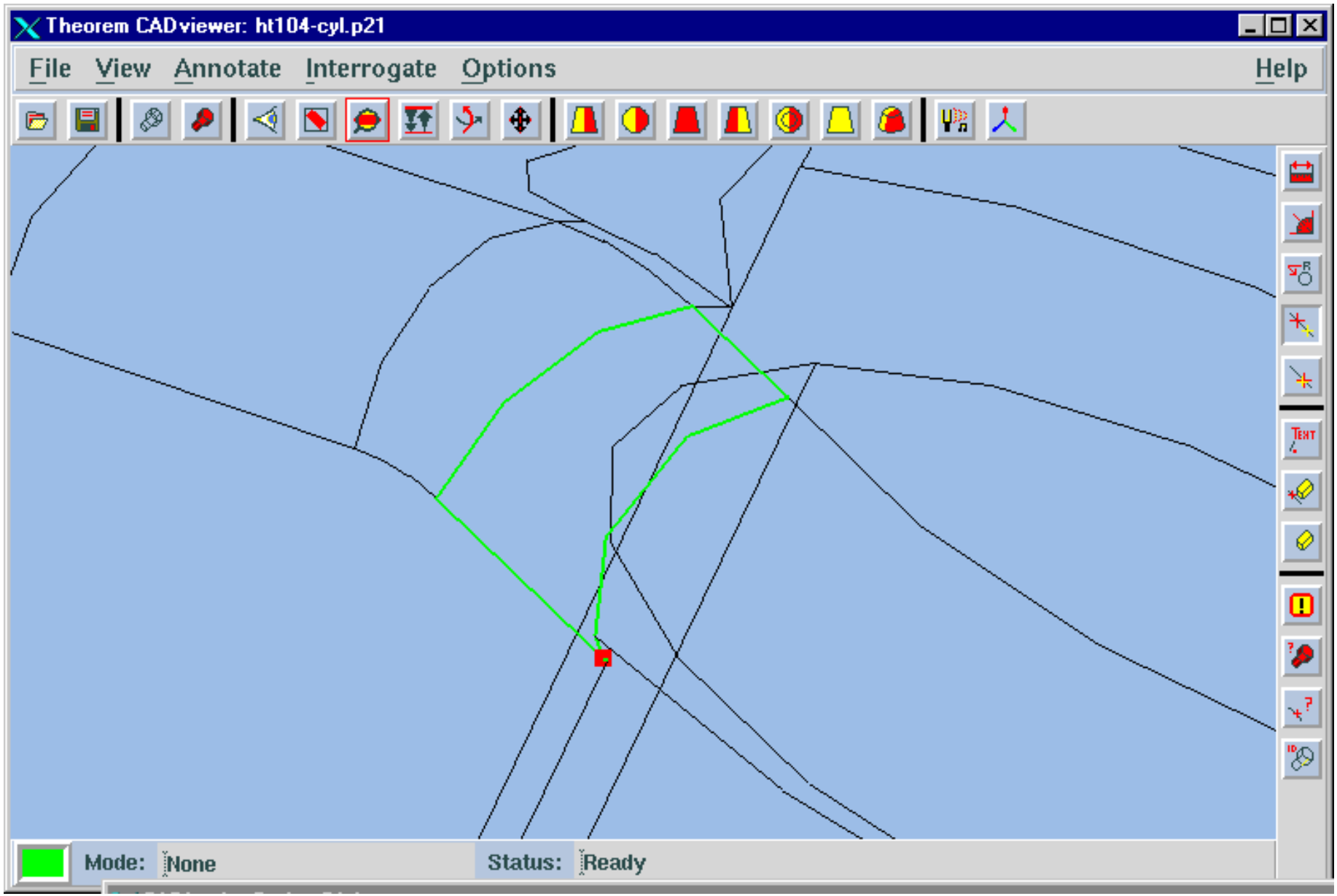
Healing within STEP

Theorem Solutions



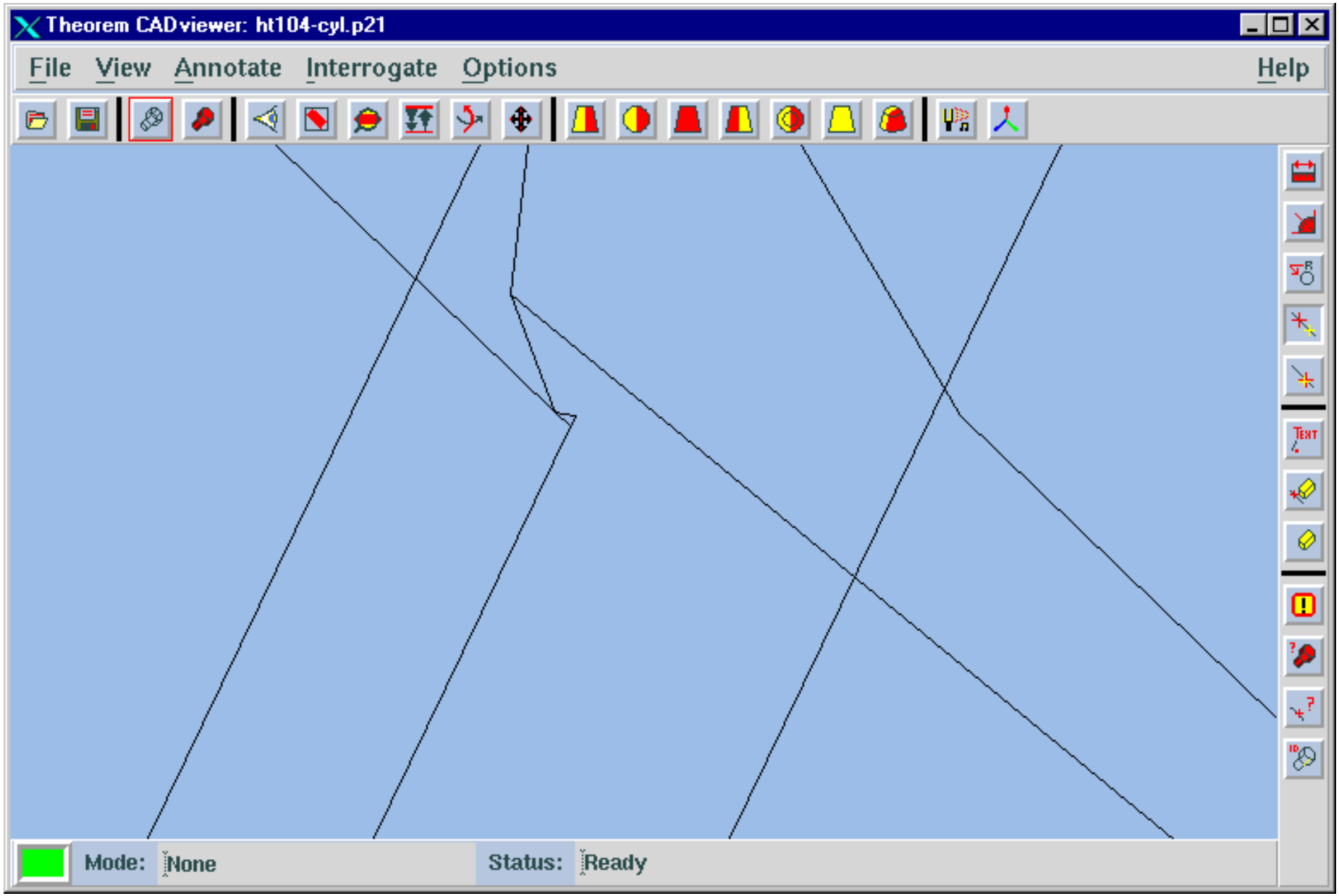
Healing within STEP

Theorem Solutions



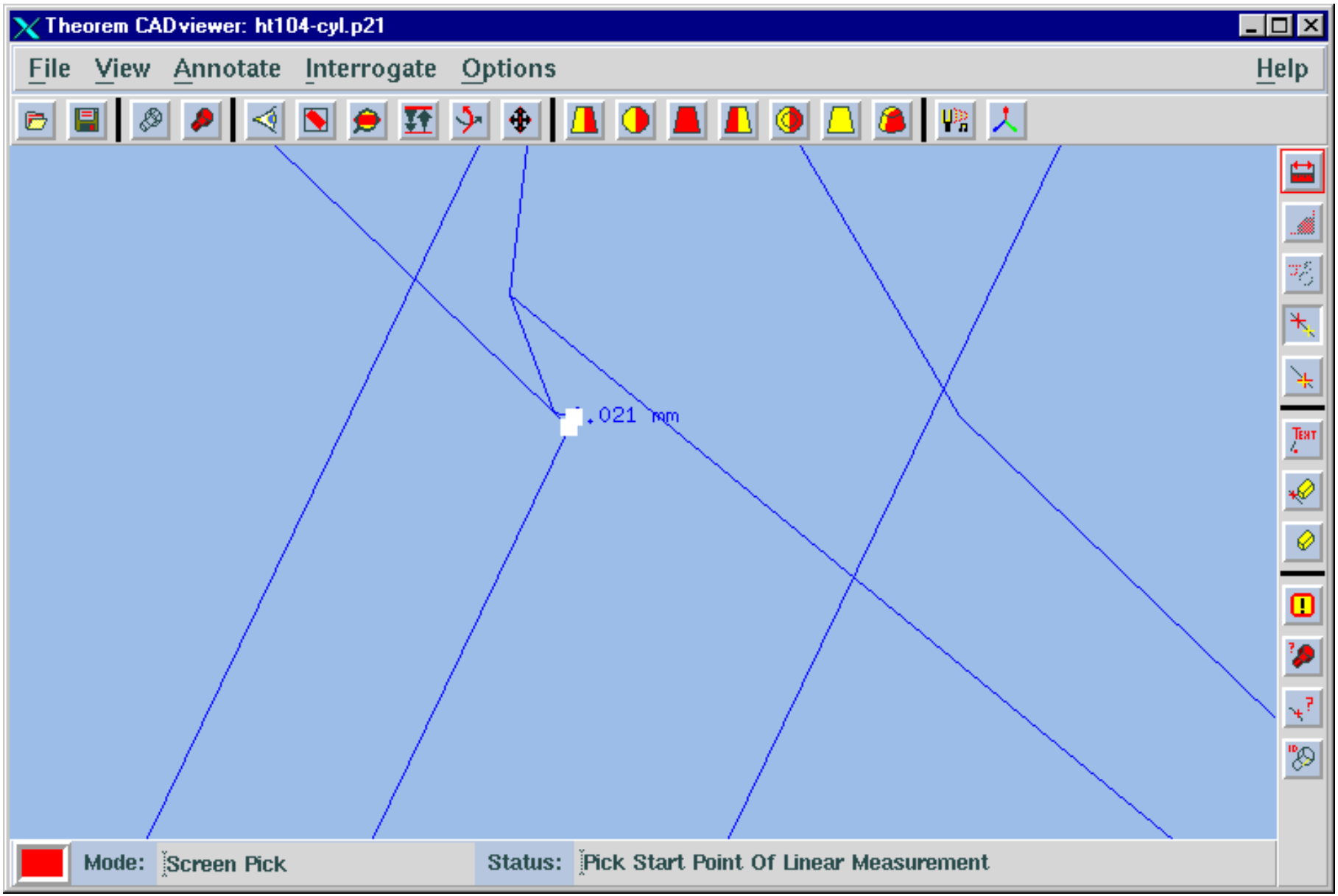
Healing within STEP

Theorem Solutions



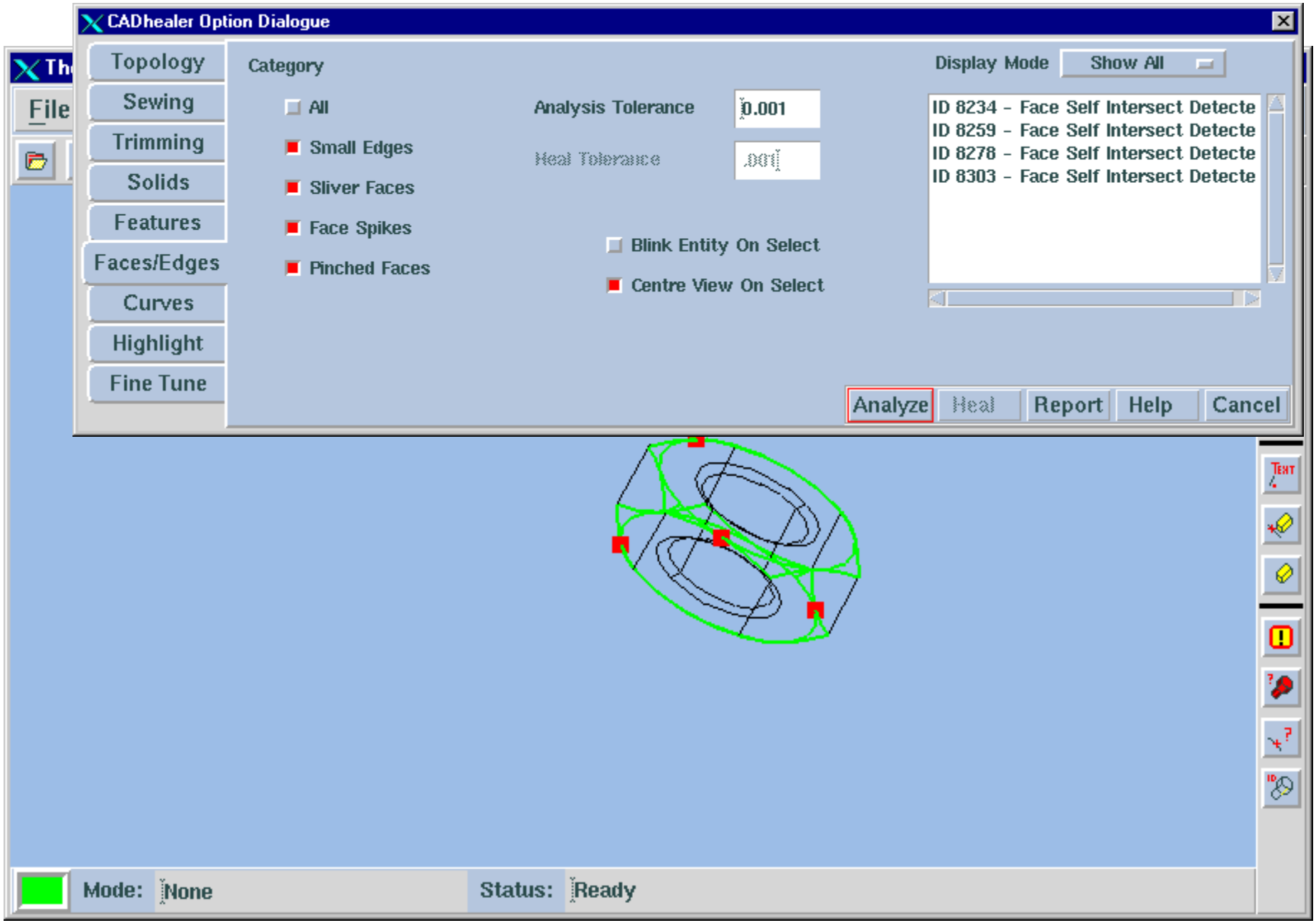
Healing within STEP

Theorem Solutions



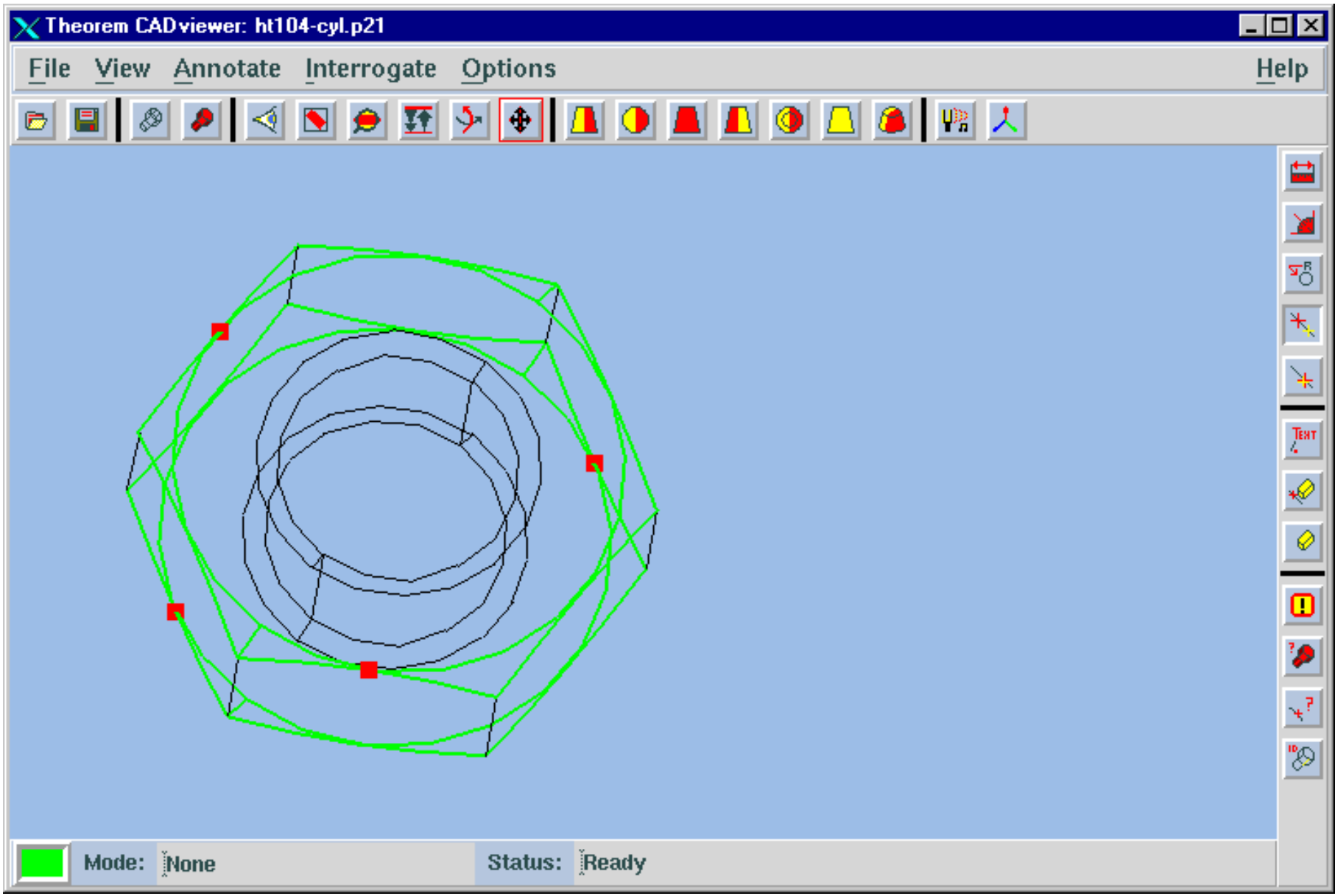
Healing within STEP

Theorem Solutions



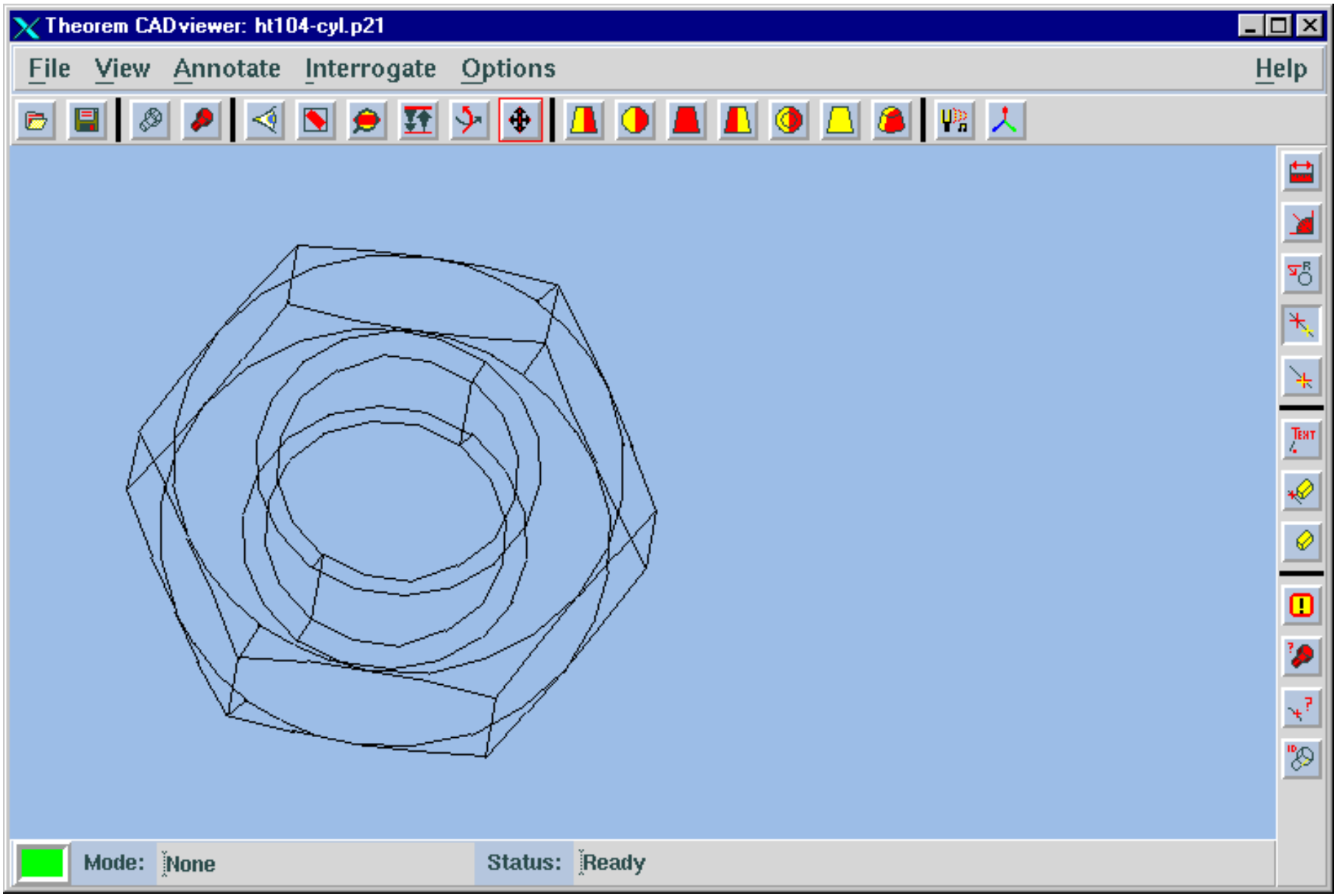
Healing within STEP

Theorem Solutions



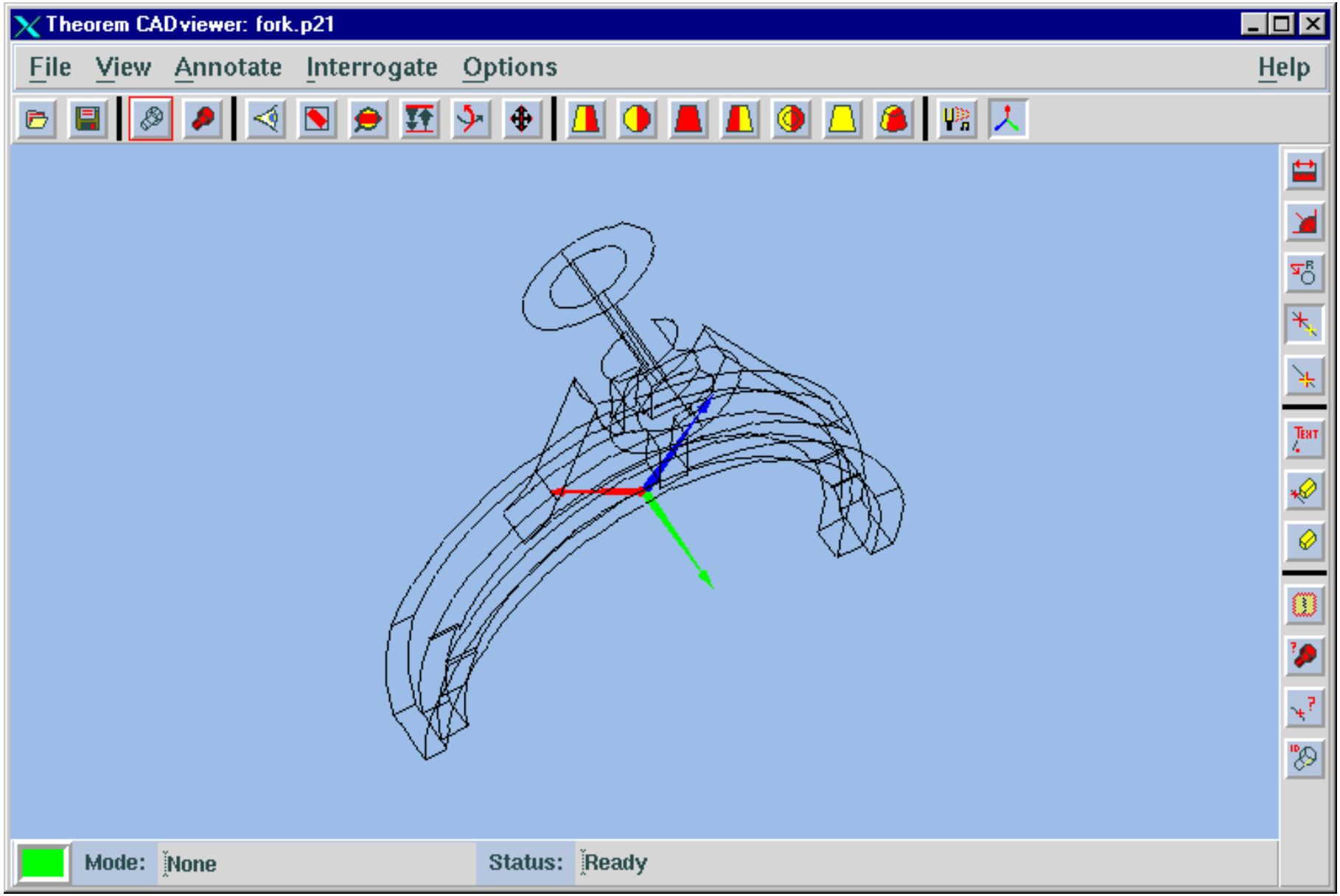
Healing within STEP

Theorem Solutions



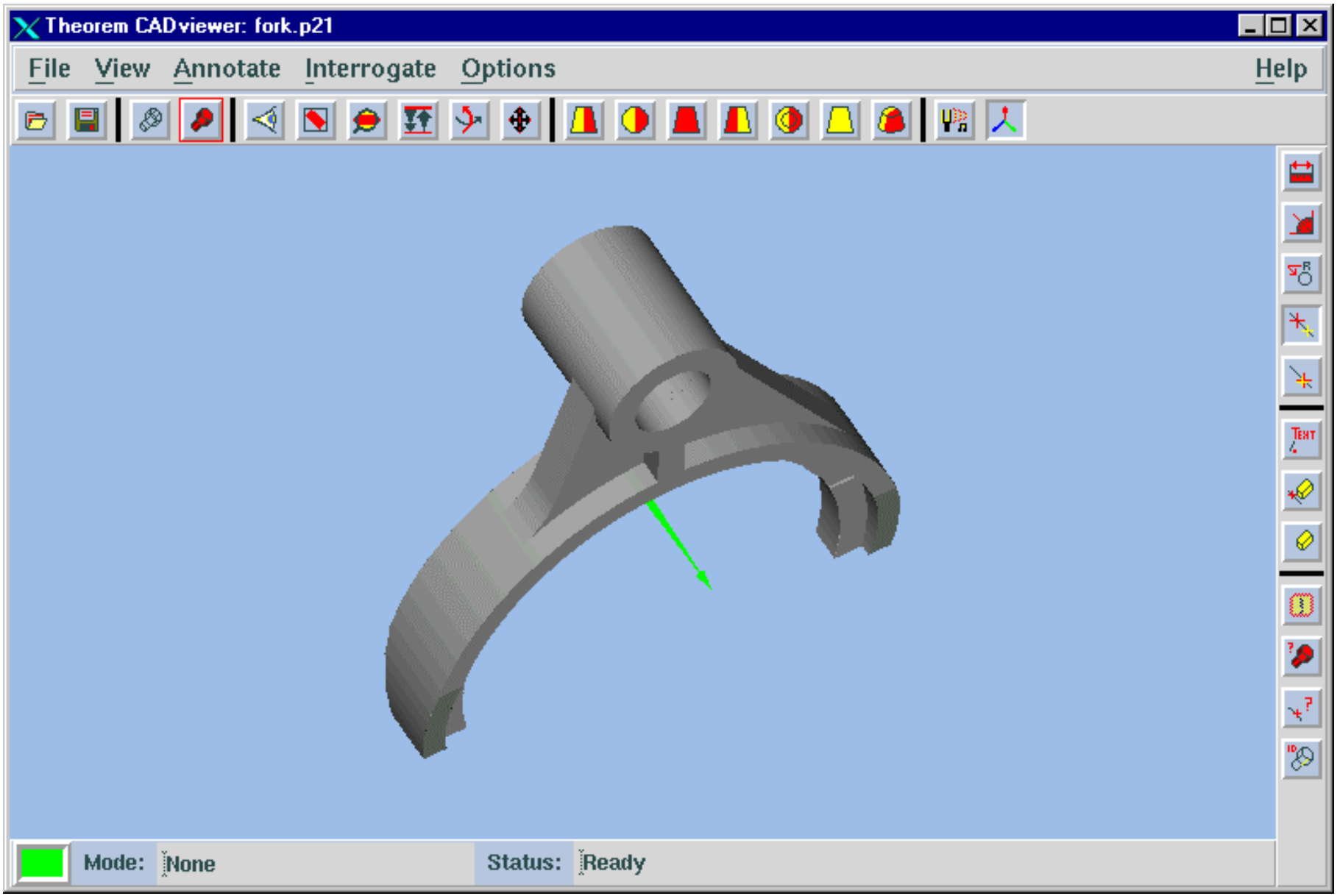
Healing within STEP

Theorem Solutions



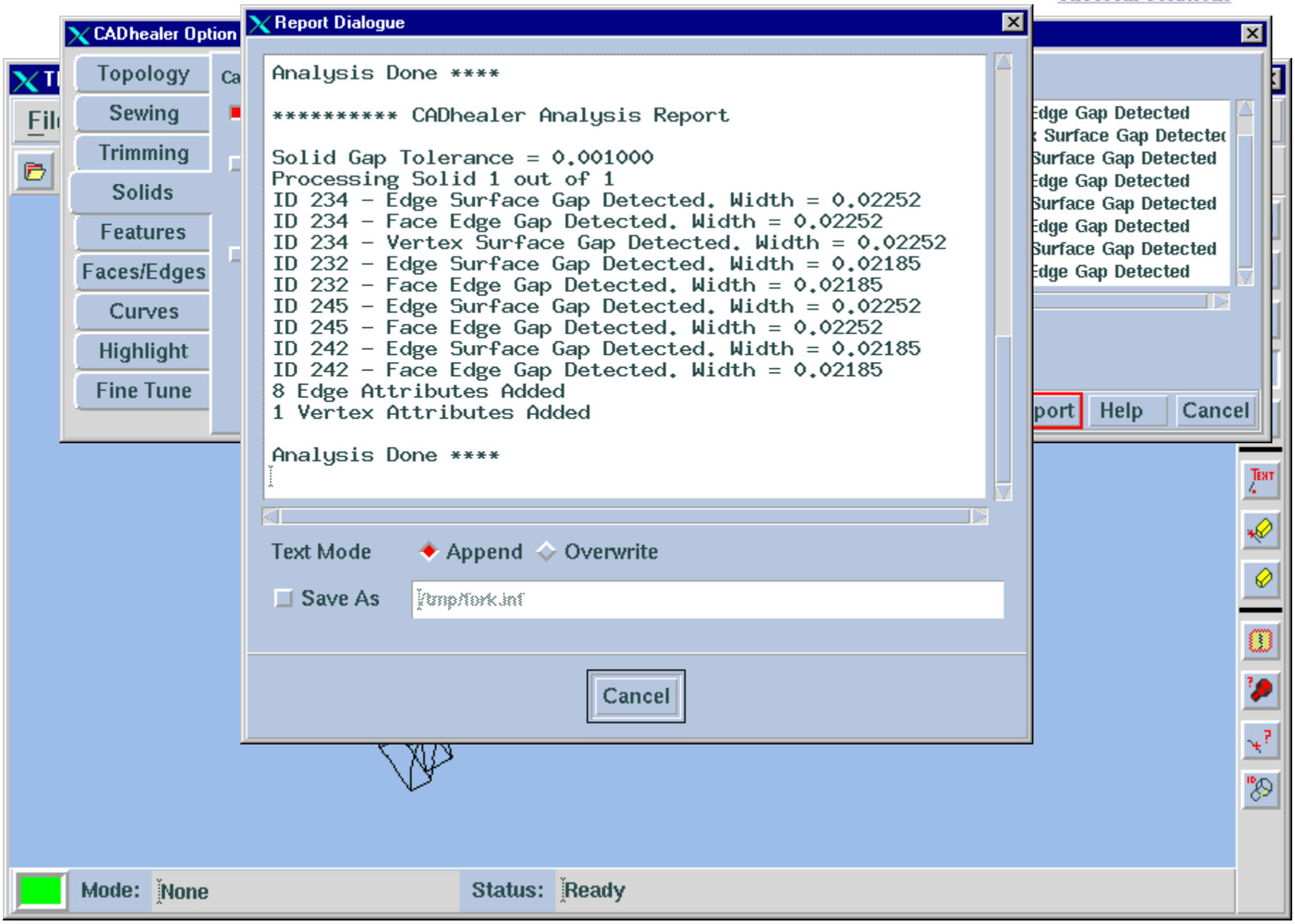
Healing within STEP

Theorem Solutions



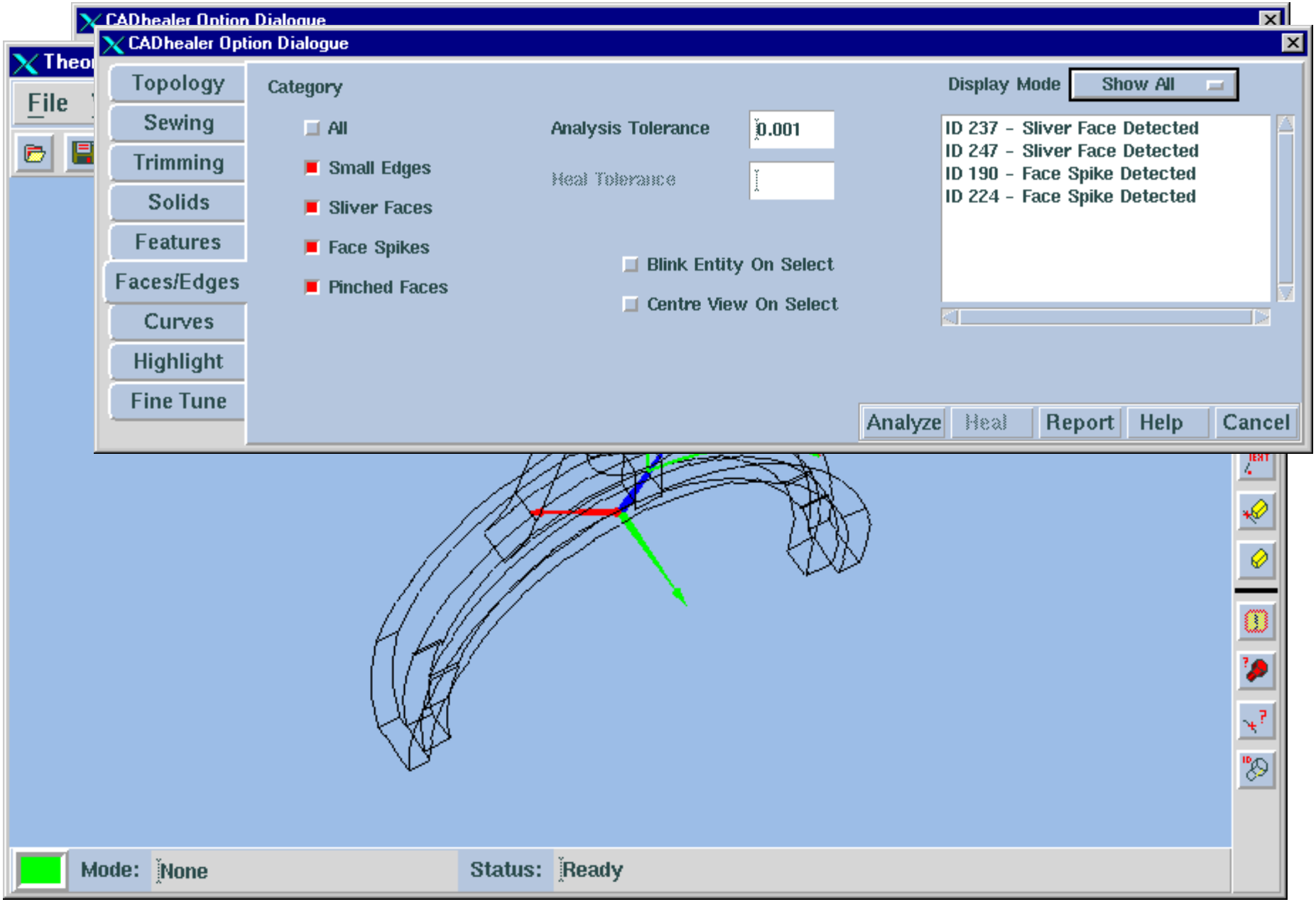
Healing within STEP

Theorem Solutions



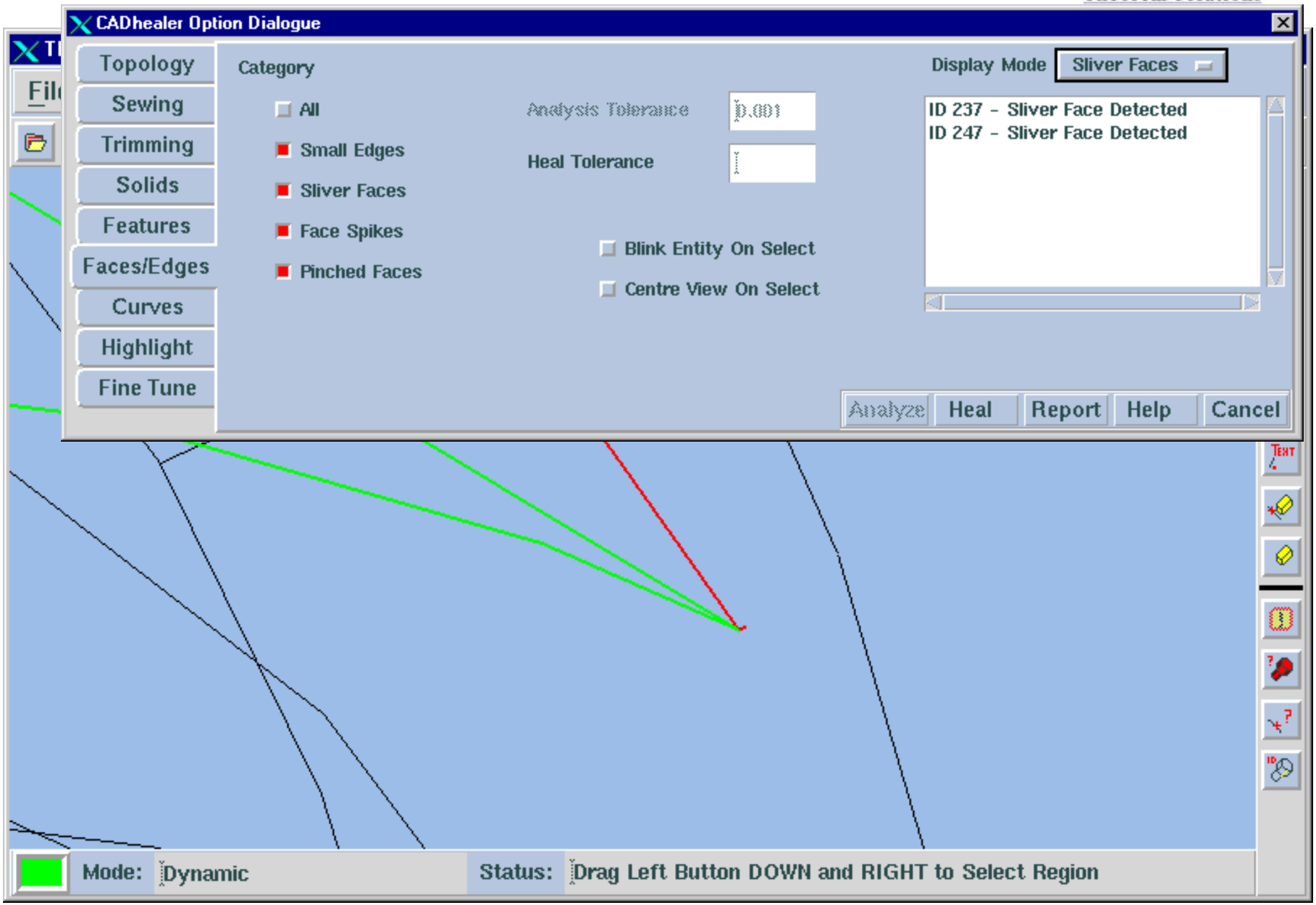
Healing within STEP

Theorem Solutions



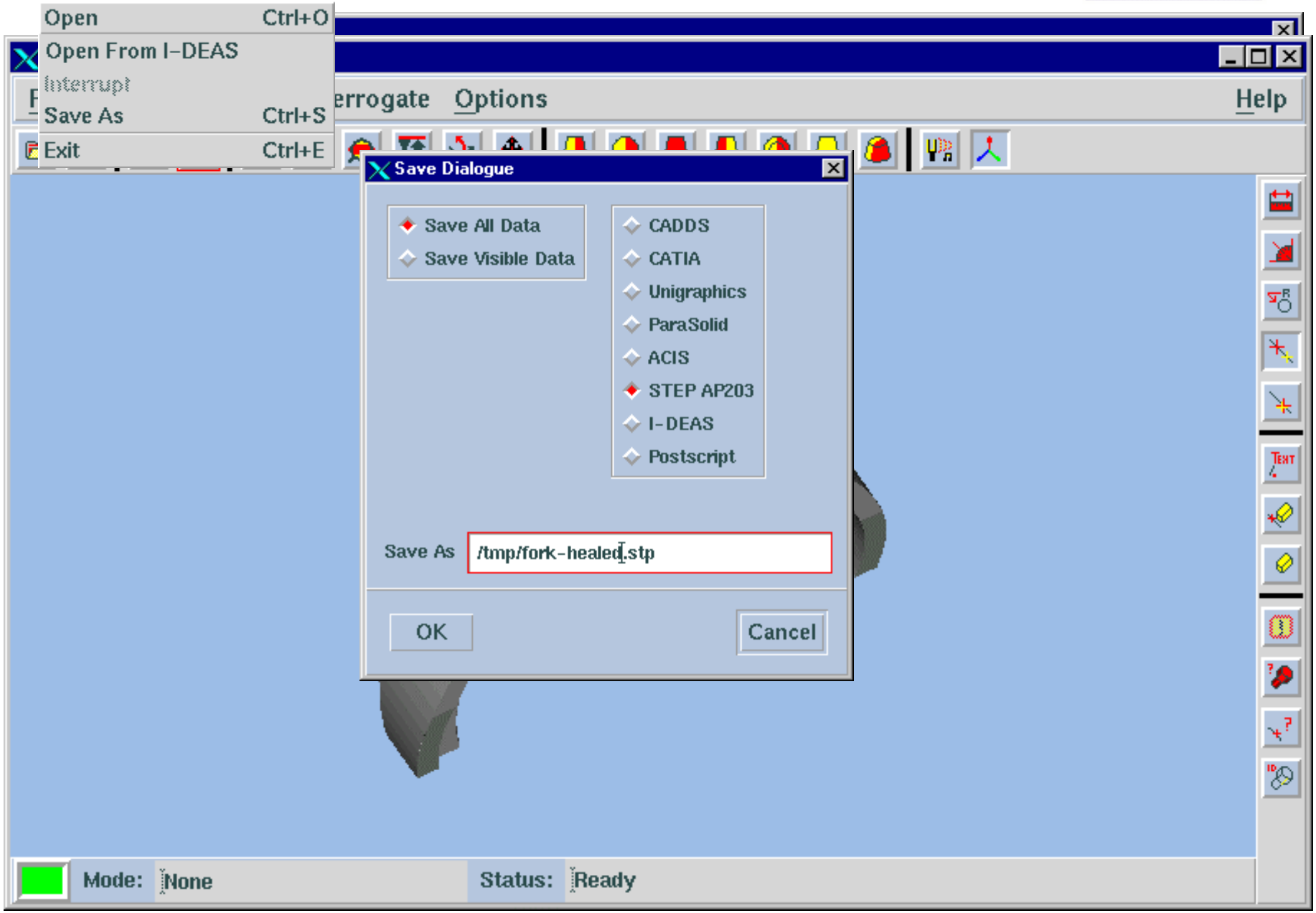
Healing within STEP

Theorem Solutions



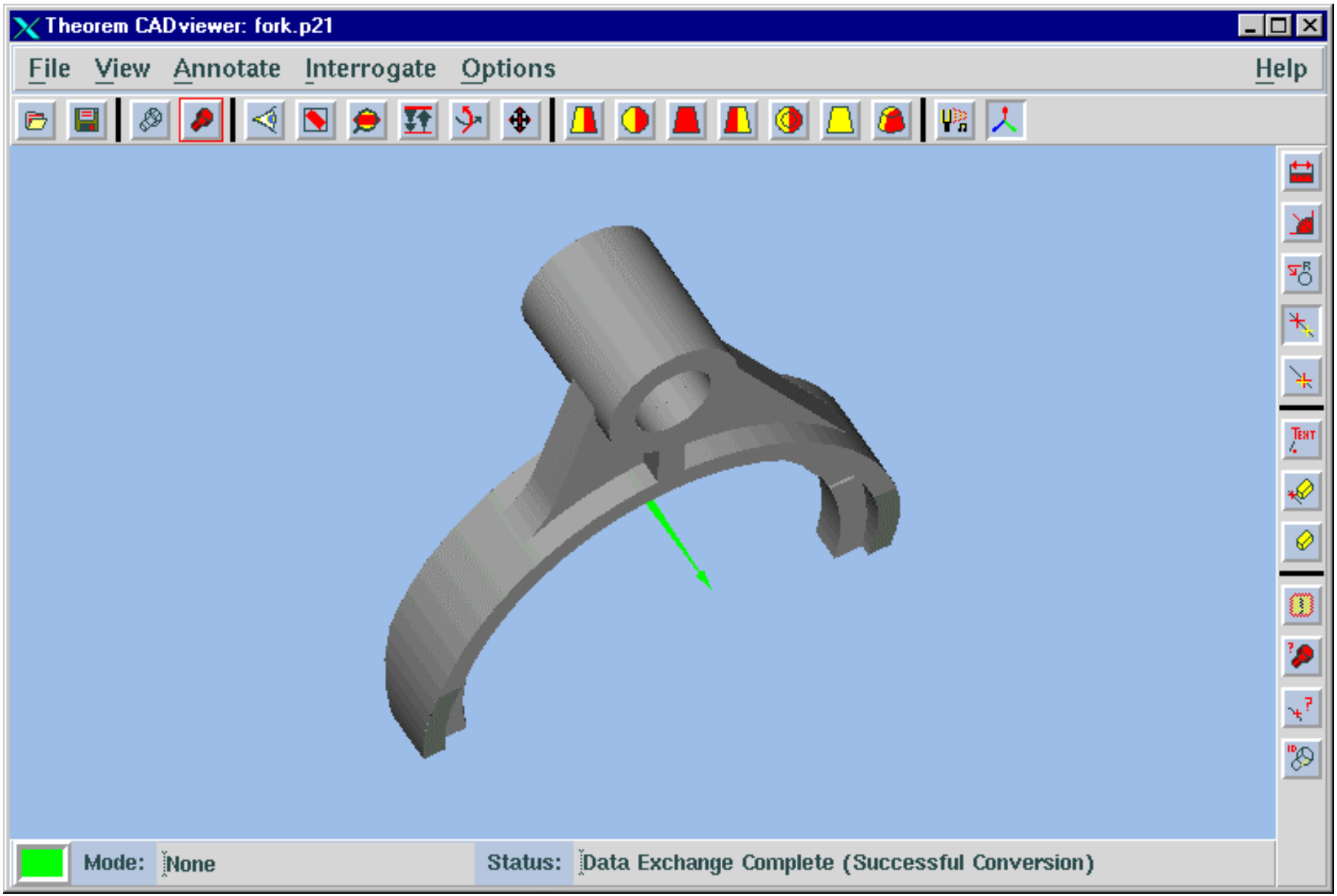
Healing within STEP

Theorem Solutions



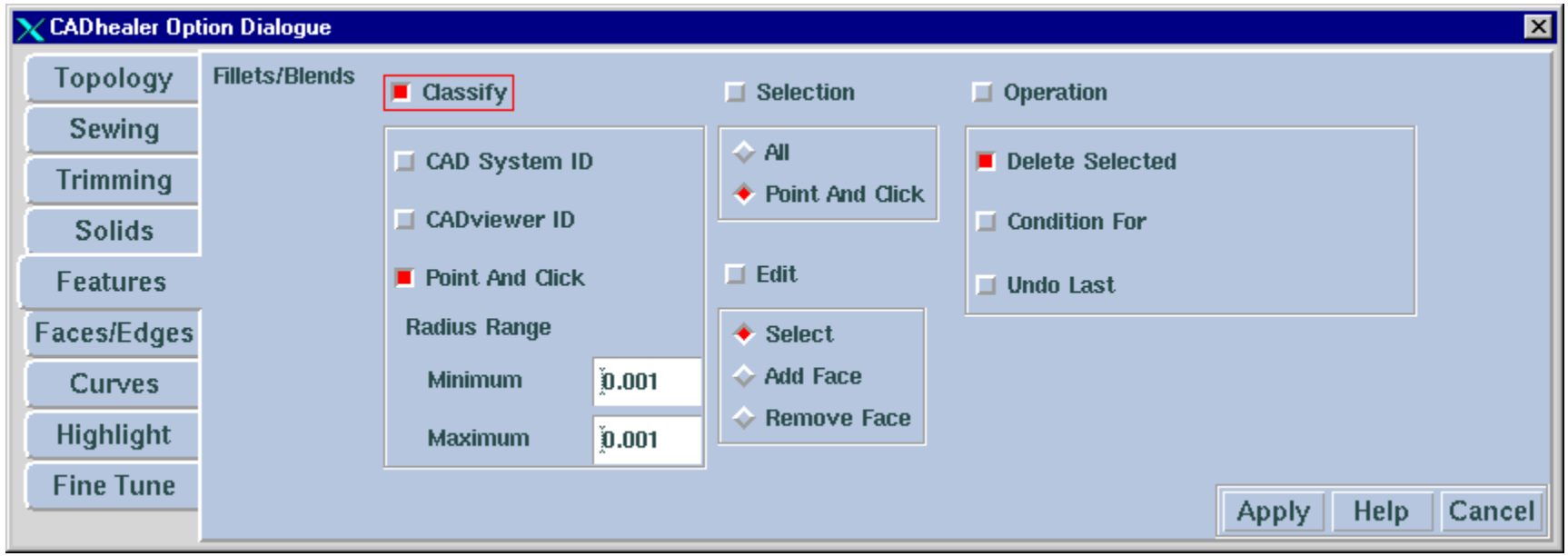
Healing within STEP

Theorem Solutions



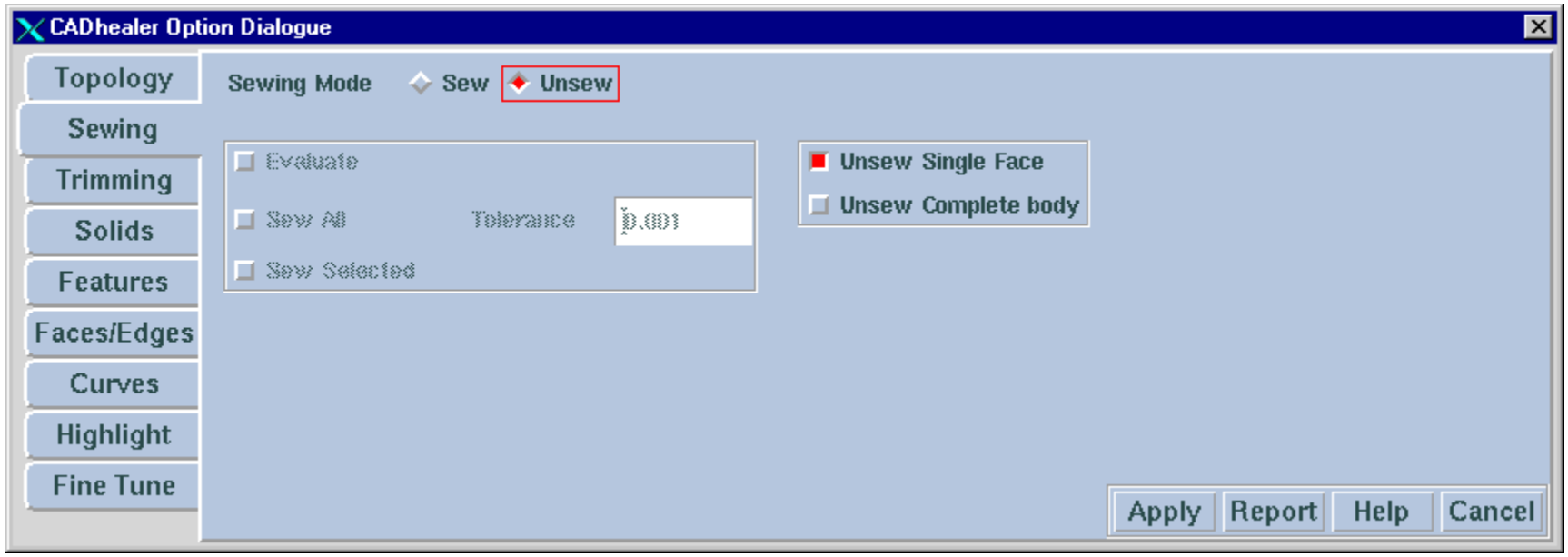
Healing within STEP

Theorem Solutions



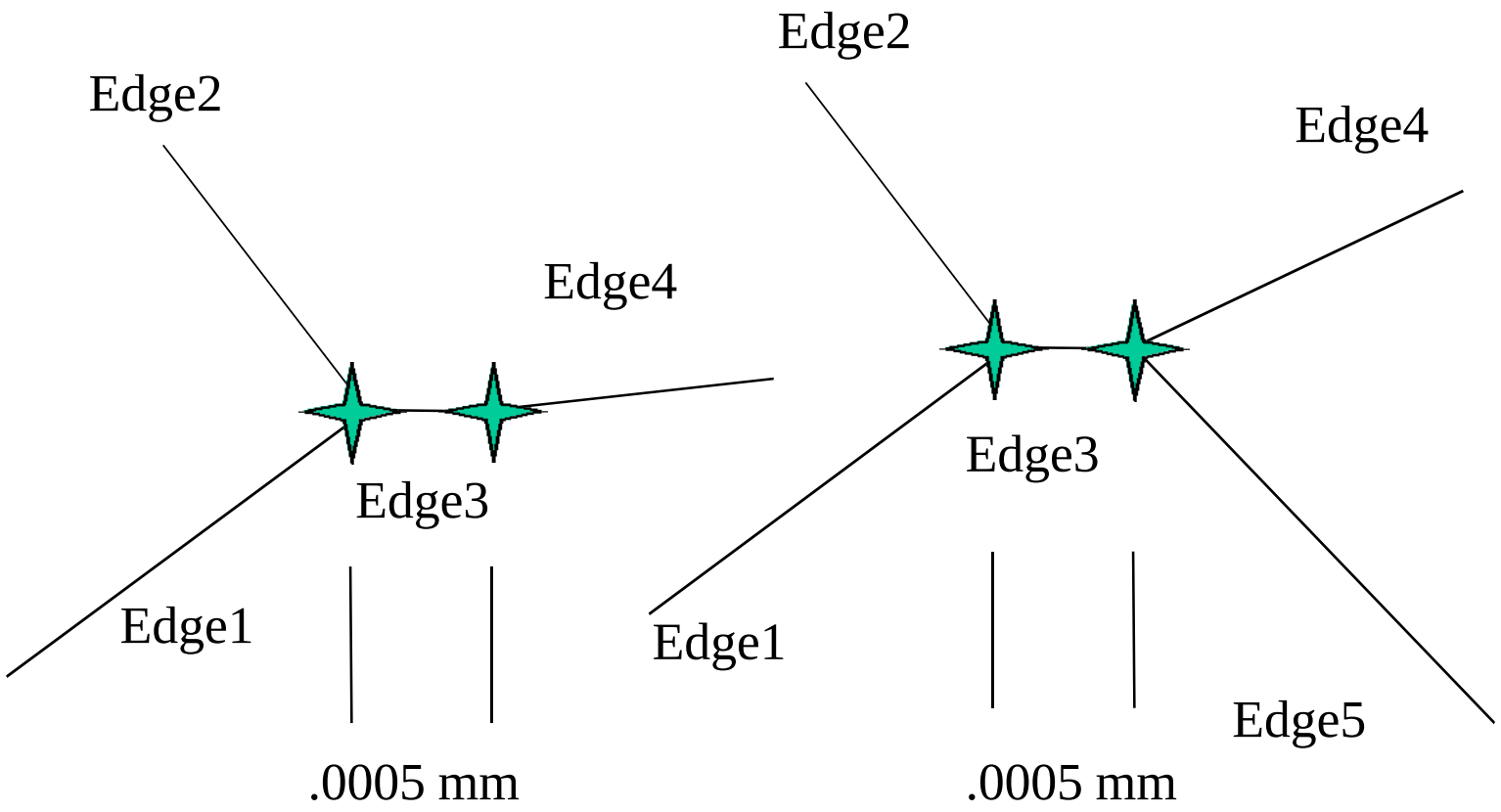
Healing within STEP

Theorem Solutions



Theorem Solutions

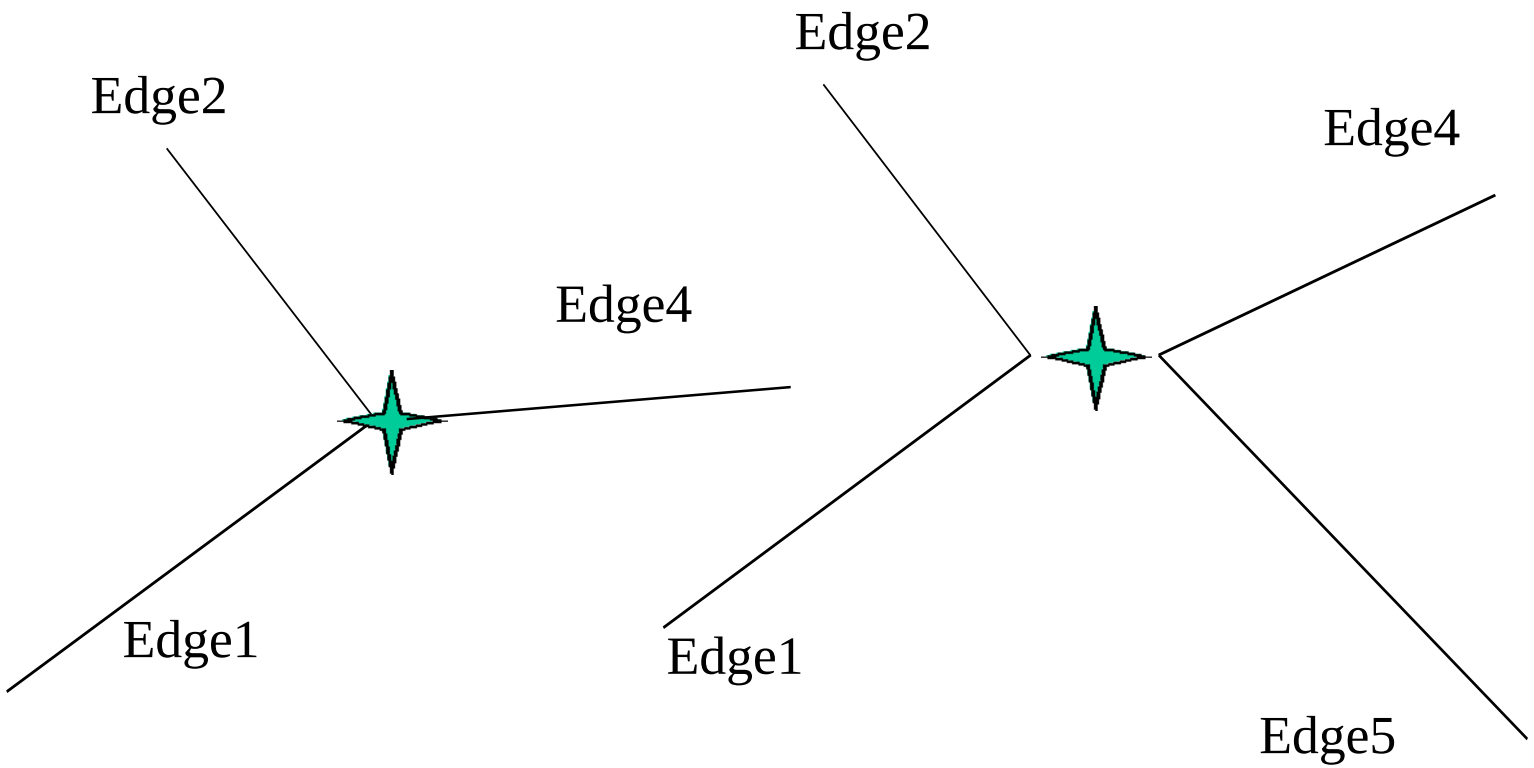
Small Edge Problems



Healing within STEP

Theorem Solutions

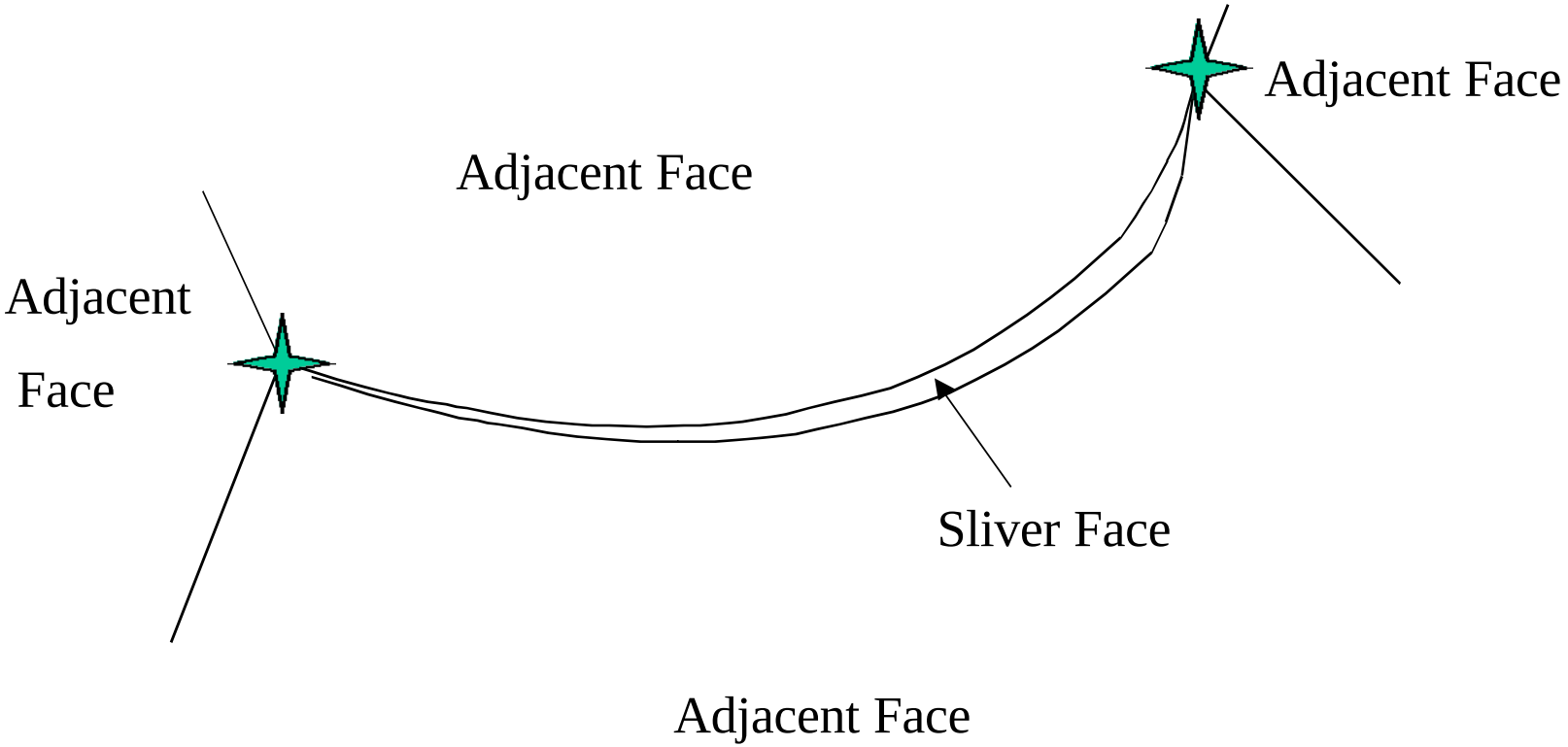
Removal of Small Edge



Healing within STEP

Theorem Solutions

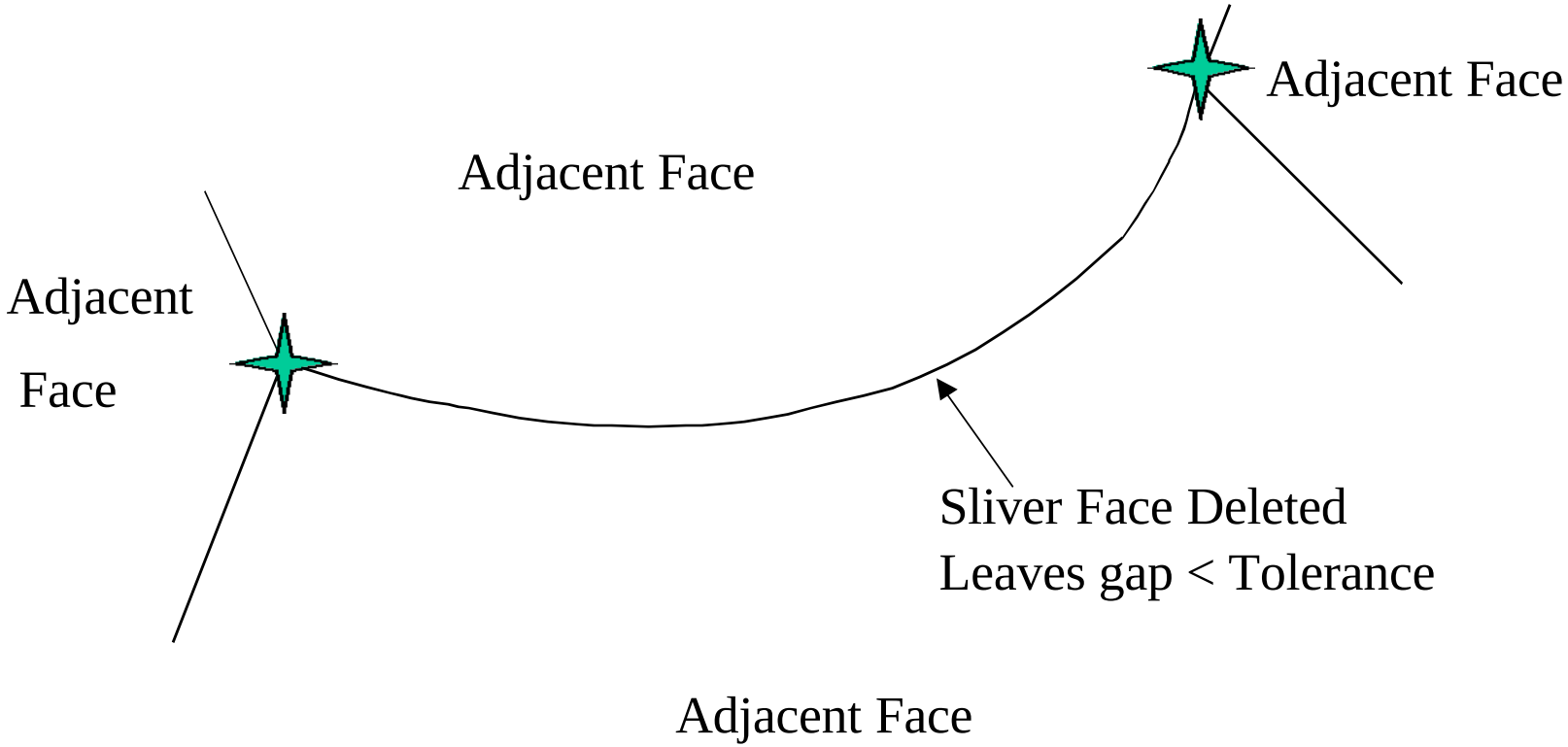
Sliver Face Problems



Healing within STEP

Theorem Solutions

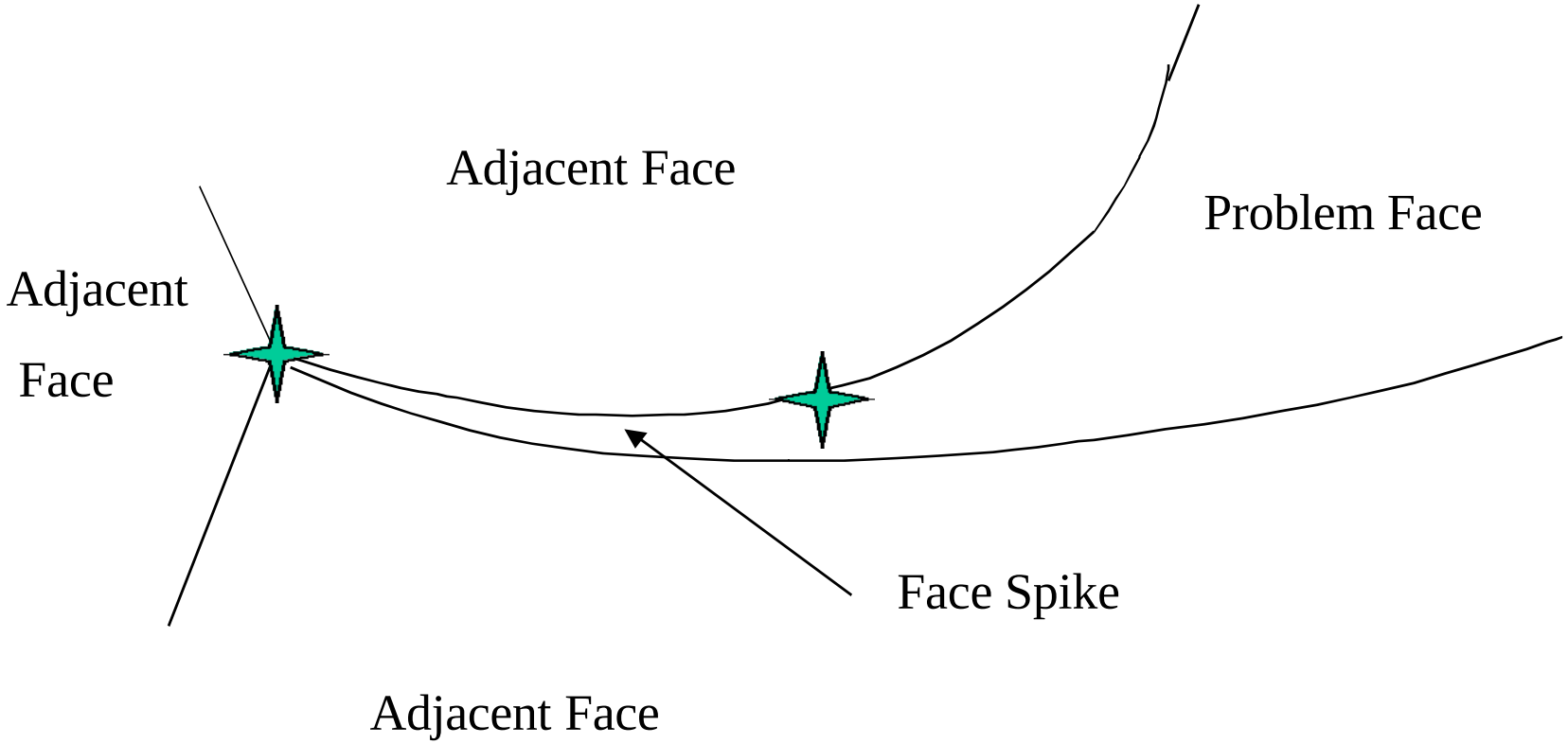
Removal of Sliver Face



Healing within STEP

Theorem Solutions

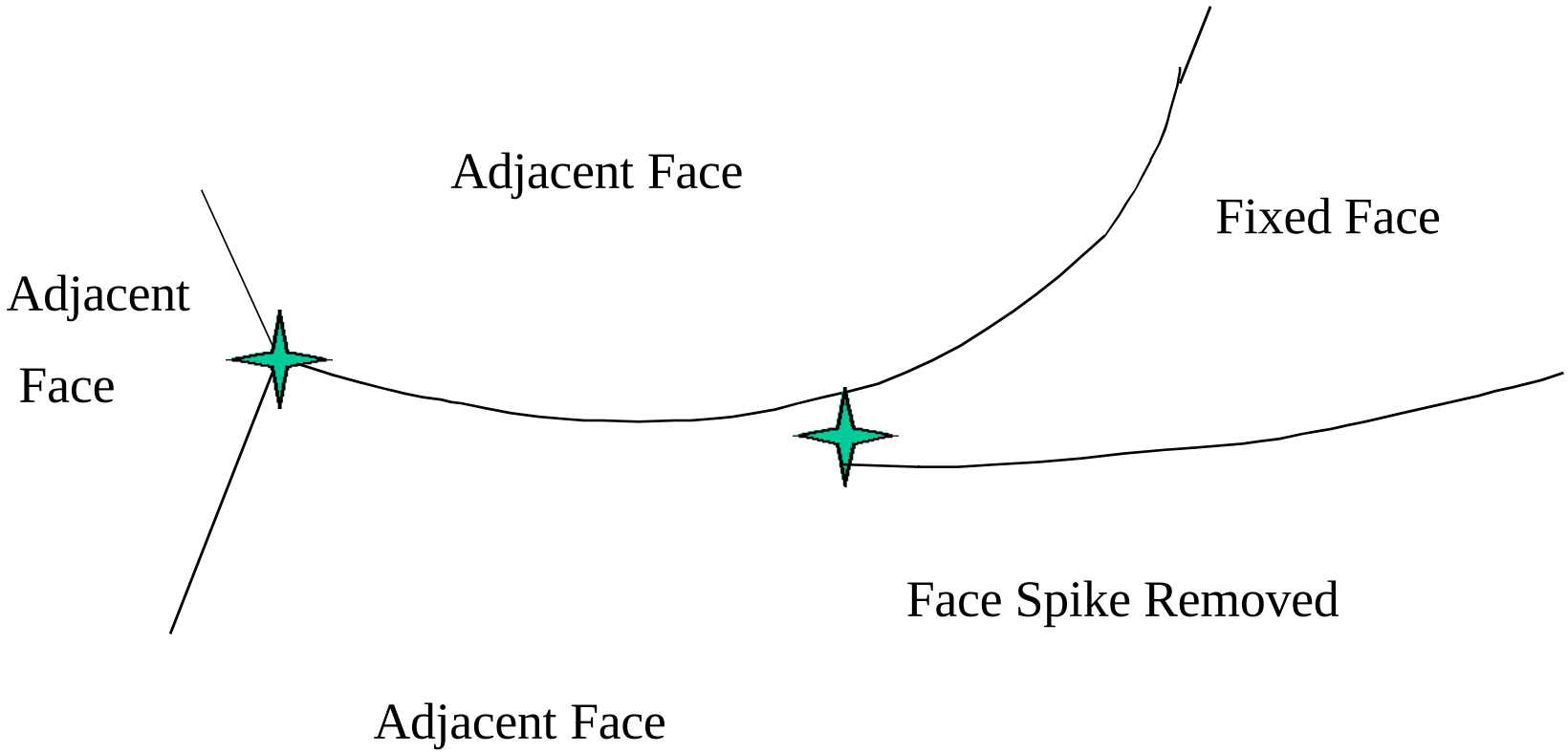
Face Spike Problems



Healing within STEP

Theorem Solutions

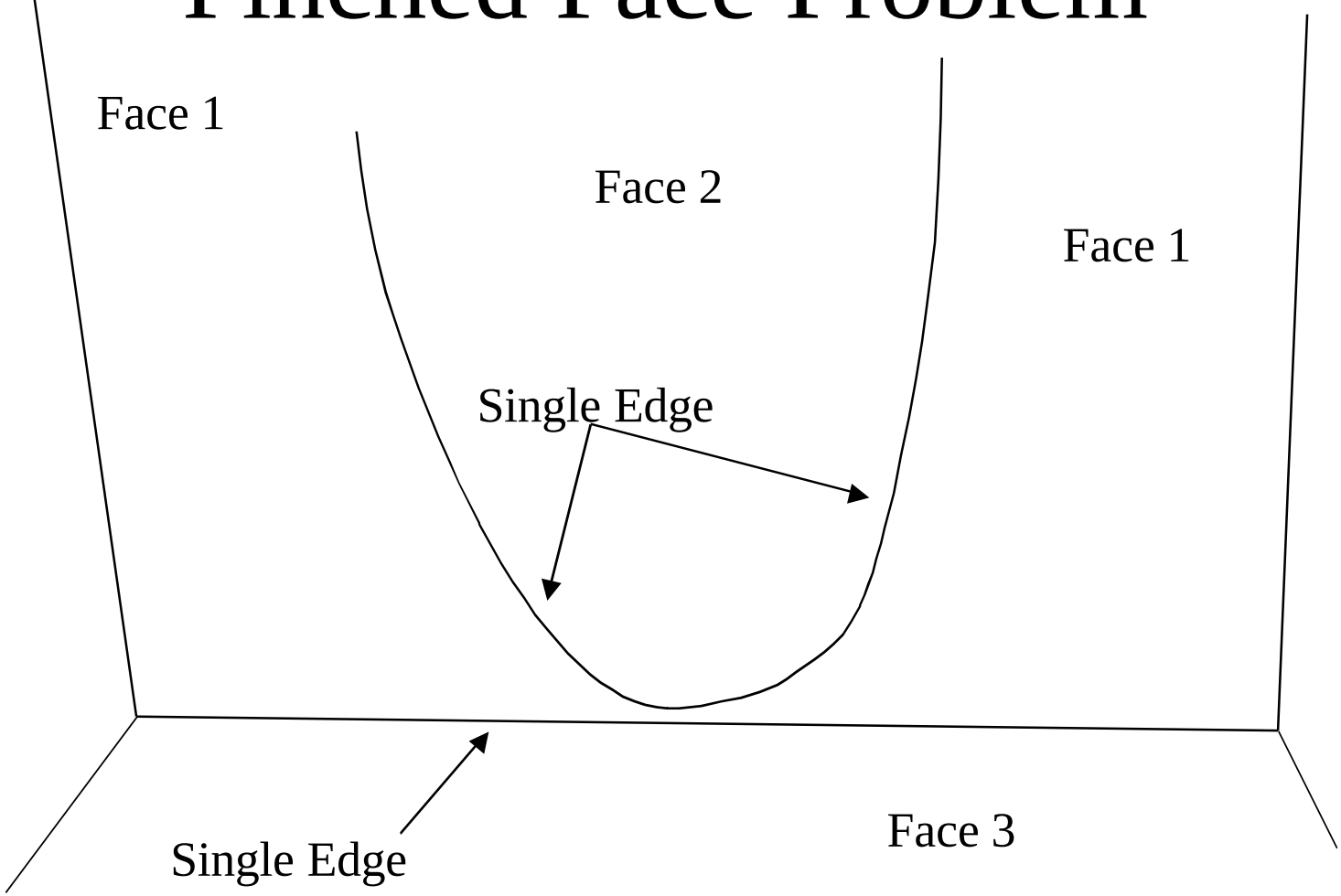
Removal of Face Spike



Healing within STEP

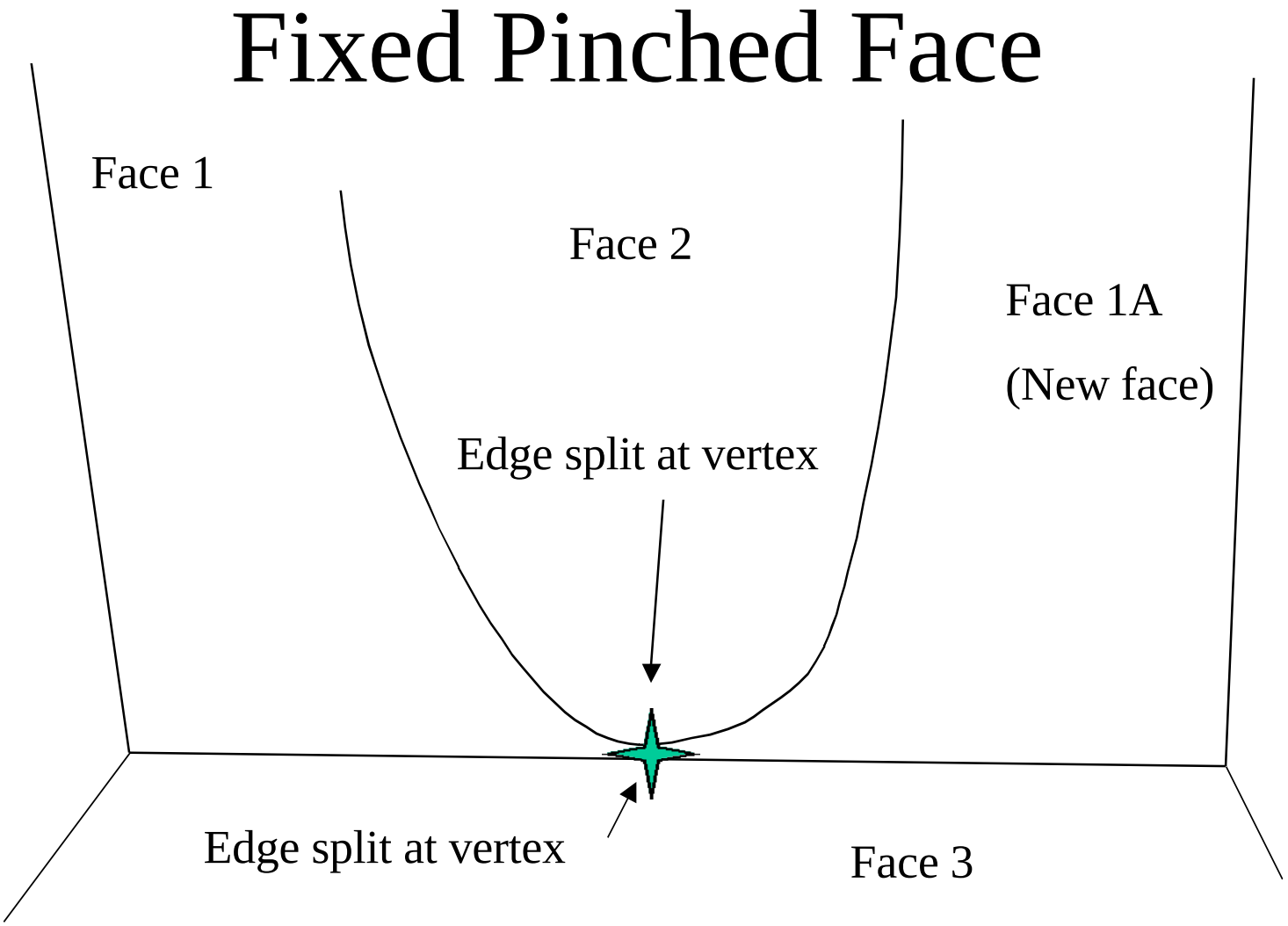
Theorem Solutions

Pinched Face Problem



Healing within STEP

Theorem Solutions



Theorem Solutions

Solid Gap Healing

Basic Assumptions

The body - topology and geometry - provides a definition of the design intent which is accurate to a certain modelling tolerance

It is permissible to manipulate the topology and geometry by amounts which are small relative to engineering and manufacturing tolerances in order to provide a new definition of the body

Healing within STEP

Theorem Solutions

Solid Gap Healing

Body	Face	Edge	Vertex
	Surface	Curve	Point
		Surface Intersection	Curve Intersection
			Multiple Surface Intersection

Theorem Solutions

Solid Gap Healing

Surfaces Rule

=> Edges and vertices redefined from surfaces

Theorem Solutions

Solid Gap Healing

Edges classified as intersecting or parallel

Intersecting edges recalculated if necessary

Parallel edges => surface modification

Healing within STEP

Theorem Solutions

Summary

STEP is becoming an accepted and successful option for moving data between systems.

As different systems have different validity and tolerance requirements some manipulation of the data is necessary.

Interactive access to ‘Healing’ software provides options to improve successful data exchange. (As confidence grows, automatic healing may become acceptable.)